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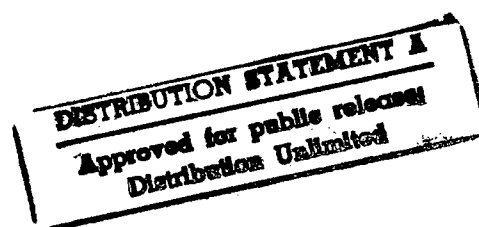
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Science & Technology

***USSR: Science &
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Science & Technology

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Academician Sheyndlin on Problems of Soviet Science

*18140294 Moscow NAUKA I ZHIZN in Russian
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[Article by Academician A. Sheyndlin: "Reality on the Shoulders of Science"]

[Text] Not that long ago, when talking about the idea of creating the Moscow Power Engineering Club (I am among its ardent supporters) with a well-known journalist, the discussion touched upon several novelties in the USSR Academy of Sciences (AS), particularly the rigid observation of the age limit rule for the leaders of Academy scientific institutions. Let me note that this decision (correct in all senses) has affected me as well—I was prepared to leave (due to age) the post of director of one of the Academy's largest research centers, the High Temperatures Institute.

On this subject, my interlocutor made a remark that I had not expected: "Now, you will get the opportunity to be absolutely independent in your opinions." Really, whatever they may have said, a person's fairly high administrative post and the corresponding public position inevitably leads to self-restriction of expression on one problem or another.

So, without my previous director's self-restriction, I consider it possible to share my concern, caused by the reduced prestige of domestic science and its noticeable lag behind the world level. A number of signs today indicate that the condition of Soviet science and scientific and technical progress is far from favorable. Some of our greatest scientists believe the overly small number of Nobel prize winners or their complete absence in many scientific fields is one such sign, although I think it is only a partial, not a definitive indication. In my opinion, and that of a number of specialists as well, the insignificant index of citation for the results of work done in Soviet scientific centers is a far more accurate criterion for evaluating the low level of our scientific research. I would like to cite yet another, it seems to me, very important indicator of the level of our scientific work. It is the fact that young specialists from other countries are not striving to work in one of our scientific centers or another, under the guidance of one great Soviet scientist or another. I explain this not so much as due to formal difficulties, as much as, unfortunately, to the typically low level of research being done by us and the entirely unsatisfactory equipment of laboratories.

As far as scientific and technical progress is concerned, various improvements in technological processes on the basis of scientific achievements are often considered its only expression. It goes without saying, it was thus possible to obtain enough definite useful results without great risk. However, true progress is expressed above all in fundamental technical and technological breakthroughs on the basis of profound achievements in basic science. Alas, fundamentally new scientific results in and of themselves can far from always be manifested in

one technical application or another. Only realistic and simultaneously creative thinking, with flights of fancy, is capable of discovering, realizing, evaluating and using this possibility. This process, difficult in itself, is still, as a rule, accompanied by a struggle against inertia of thought, against fear of risk, and often against departmental indifference and, unfortunately, frequently ends with the victory of sluggishness. Nonetheless, this way turns out to be the best of all time, as confirmed, in particular, by examples from the history of power engineering.

In Germany about 88 years ago, an engineer, Holtzwardt, succeeded in designing the first gas turbine system which burned fuel at a constant rate. However, in terms of their technology, design elements, metal requirements and other characteristics, these systems demanded the solution of numerous problems and were thus clearly ahead of their time. The imperfection of the first gas turbines and, due to this, their low competitiveness compared to steam turbine and diesel engines later led to a halt in the production of these systems. However, regardless of the original negative results, this was something new, for the sake of which it was worth taking a risk: with the future creation of highly efficient gas turbines which burn fuel at constant pressure and with the introduction of turbines in stationary power engineering, aviation and shipbuilding, people returned to Holtzwardt's work. It is precisely Holtzwardt's experience, to a significant extent, that enabled the creation of gas turbine airplane engines in Germany in the mid-1940s and, using the principle of burning fuel at a constant rate, the development of the FAU-1 rocket.

The next example related to a decision by American companies, above all "General Electric," which decided to develop in the early 1920s the so-called binary (mercury-water) electric station with Emmet boilers, which should presumably have raised the level of useful output and reduced fuel consumption.

The creation of binary electric stations, like Holtzwardt's systems, was also ahead of its time, since knowledge in the field of the technology of mercury systems (liquid, as well as steam) was quite inadequate at that time. The development of binary stations required the most extensive scientific and technological research, the results of which to this day retain important significance for power engineering. In the late 1940s and later, during the creation of fast neutron nuclear power stations, the experience in working with mercury 20 years ago was extensively utilized.

As is evident, great scientific and technical advancements have always been distinguished more by thorniness, than easiness. Significant ideas are often obviously ahead of their time and, incidentally, it ought to be this way in those cases when ideas are really worthwhile. It is comforting that the difficulties of implementing such ideas are rewarded with success in the end. It is my profound conviction that the search for fundamentally new solutions in creating technical equipment, systems,

and devices is always exceptionally useful. Of course, in achieving the intended purpose, it is important above all to obtain a direct result, yet the mixed results that always accompany the main goal are also of interest, since their significance is often no less important, than the solution of the basic problem. However, unfortunately, our firmly established practice of an unjustifiably cautious attitude toward finding fundamentally new solutions, often explainable by an absence of corresponding foreign analogs, is distressing. While the root of the evil lies not so much in this, one could say, destructive caution, as much as in its profound causes, which I would like to consider in more detail.

An important prerequisite for the development of NTP [Scientific and Technical Progress] relates to the role of state mechanisms, which are supposed to create conditions for possibly rapid scientific and technical advancement by providing large development projects with investments and material and technical resources. When making this type of decision, the problem is to act on the basis of democratic principles, instead of the inevitable arbitrariness on the part of a certain group of leading officials, to act without the influence of the strong of this world. I remember the pre-war days, the "golden age" for development of our science. At that difficult time, young people with a "selfless" nature, hungry for knowledge, aspired toward scientific work due to a genuine attraction to it. The material situation of scientists was relatively poor then, and even the prestige of scientific work, to say nothing of honor, was highly relative (it suffices to recall the situation in the "Shakhtinskiy" affair or, somewhat later, the "Prompartiya" case, not to mention the 1937-1938 period). Yet, in such a situation a relatively small detachment of first-class scientists was formed, closely tied to the economy in many cases. I will not mention individual names from among this glorious cohort: many of them are famous and our people can be proud of them.

[Caption] In the laboratory for optical properties of substances of the USSR Academy of Sciences High Temperatures Institute, an system has been operating for more than 10 years which enables the measurement of the thermal conductivity of partially transparent materials (scientific associate S.A. Ulybin, next to the instrument). The data obtained with it make it possible to precisely calculate the design of various instruments that operate under high temperature conditions. The system, designed directly at the laboratory and manufactured by the institute's experimental production, is favorably distinguished from similar foreign models by its basic design. However, the system cannot fully realize its "idea superiority, particularly because the main part—a series domestic laser—has a clearly inadequate radiation intensity. Better peripheral equipment for the data processing system also remains to be desired.

After the war all of a sudden, since Stalin loved doing this, a resolution was passed at the end of 1946 on the unusually sizable strengthening of the material situation of workers in science and VUZ [higher educational

institution] teachers, whose salaries were increased several-fold just about everywhere. Thus, the standard of living for workers in science and VUZs became incomparably high, compared to many other social groups in our country.

It would seem that this resolution would have created conditions for the tempestuous development of Soviet science. However, in my opinion (this may be debatable for many), this large state action turned out to be more of a harmful, than favorable influence on our science. Everyone who had long been familiar with the organizational aspect of work in our science and in the higher schools, knows that go-getting young people, possessing many qualities but, as a rule, just lacking talent or having an allegedly creative potential on an average level, went into science in droves right after this resolution.

Moreover, I will be so bold as to assert that precisely in the post-war period these very bright people, who had gone into science, crowded out genuinely talented people and in the future managed to so secure their positions in the organizational structure of our scientific centers and VUZs, to so transform the concept of the scientific ethic, that the natural replacement of cadres, particularly necessary in the research institutes and VUZs that had forged these cadres, was practically excluded. The irrepressible aging of our science began, which statistics also confirm. Thus, in the USSR Academy of Sciences system, doctors and candidates over 50 years of age made up about 20 percent of the total in 1972, in 1982—30 percent, and according to forecasts, they will number from 45 to 50 percent in 1995.

It is interesting that the share of highly skilled employees of up to 40 years of age, the most productive age for scientific creativity, is approximately 10 percent lower in our academic science, than in corresponding American centers. Incidentally, let us note that the problem of rejuvenating science in the United States is solved naturally due to the timely transfer of middle- and senior-aged scientists into management, consulting, industry, etc.

Thus, it should be frankly admitted that two sad features are inherent in our scientific institutions, including VUZs, today: the widespread dullness of cadres and their great age. Hence, the steady reduction in scientific results on the whole, which is compensated for extensively due to a growth in the number of scientific organizations and VUZs, whose level often in no way conforms to their names and designated purposes. Thus, an increase in certain important statistical indicators should not be taken for real progress. For example, the following: the pedagogical cadres of VUZs consisted of 98,000 people in 1940, 340,000—in 1960, but exceeded 1.5 million people in 1987. Data on the increase in the number of scientific institutions are no less impressive: there were 786 in 1940, 1,728—in 1960, and finally, 3,200—in 1987.

It goes without saying, such a swift quantitative increase reflects certain positive processes, but nonetheless throughout all time in science, as well as, incidentally, in other fields as well, success is achieved not by numbers, but mainly by ability. So, in particular, a whole series of higher educational institutions was created in a hurry and under highly unsuitable conditions, when there was virtually no possibility of attracting somewhat skilled specialists into teaching. This, in turn, did not have the best reflection on the graduates of such so-called VUZs.

Recently, we have—and this is remarkable—stopped hiding many of the shortcomings which have accumulated over the decades and are talking about them for all to hear. I have followed this example. However, comments on the shortcomings of our science are only a part of what I would like to write. I will try to suggest things that will improve the situation. These suggestions are far from all-embracing, but they could play a definite positive role.

Here, perhaps, it would be most appropriate to speak of the Teacher's role in science. Even in the far from optimum cadre structure that has built up gradually in VUZs and scientific research institutes, there are many talented scientists, but they are unnoticeable, "diluted" in the overall mass. They should be singled out, conditions for intensive, result-producing work should be created for them and, finally, they should be assigned the role of leaders. This procedure is inconceivable without elections on a democratic basis, which is not at all the same as the customary past democracy, which related, for instance, only to secret voting. Of course, the determination, which we are all familiar with, of a scientific leader's candidacy by so-called "authorities," where suitable people are chosen according to the results of survey data, is really completely inappropriate.

By far the best method to determine a leader's candidacy is by a group of old, honored, respected and highly moral scientists. Only they are fully capable of determining and selecting scientific leaders, who will then receive the full opportunity to select a young circle of colleagues and create the appropriate working conditions for it.

How possible are these innovations in a collective that has already been formed? To put it directly, it is extraordinarily difficult to implement them. Disrupting an already-formed collective, rejuvenating it, perhaps even introducing strangers, but genuinely talented specialists, into its membership, and by the same token freeing it of accumulated ballast, is virtually impossible today. He who has once risked genuinely implementing such a transformation knows full well how this, as a rule, ends. So, what can be done? In my opinion, the solution to this situation lies in strict, but inevitable measures: the regular reduction in part of the scientific personnel based on official principles, for instance, within a limit of 3-5 percent annually, as well as the regular abolishment of 1-3 percent of scientific organizations.

What, one asks, are young people who have rushed into science because of a number of future benefits, but possess a minimal creative potential in this regard, going to do? In all likelihood, conditions should be created in society under which these young people will be able to apply their envious energy in the most diverse fields, obtaining a reward equivalent to work in science. Of course, this is a very complex problem and it cannot be solved by some sort of decree—it is a question of restructuring social life so as to best facilitate the utilization of the entire diversity of human qualities.

In this regard, it is worth carefully investigating the training of scientific cadres in higher educational institutions. Permit me to ask: is it possible to consider such training genuinely skilled, if the scientific teaching staff of even the best VUZs, as a rule, changes little, consisting of associates who entered the VUZ departments and laboratories from their student desks and are unfamiliar with industry and with life in general? The careers of these associates, from their first post right up to professorship, often take place in one in the same institute. In this connection, I am not "discovering America," but am only assessing the situation that has taken shape over decades in the higher education system more definitively, than is usually done.

As far as the state of scientific research done in VUZs is concerned, according to the statistics, everything in this category is doing splendidly: the number of VUZ employees involved with scientific work is extraordinarily large, and the research subjects are quite diverse. The volume of cost-accounting (contract) scientific projects performed in VUZs is growing so much, that recently it was even necessary to put a limit on such research.

However, allow me to evaluate all of this quite differently: the widespread search for cost-accounting contracts for one or another, as a rule, petty scientific project has become the true scourge of VUZ science, since it related the direct material support of the teachers to their degree of participation in one or another cost-accounting scientific research project in the VUZ departments. Hence, the small scale of the scientific problems being raised, and hence, the low skills of the cadres. Yet, representatives of national economic sectors in most cases willingly accept this, so as to pump a relatively small amount of funds over to the VUZ within the framework of the cost-accounting agreement and by this token ensure an insignificant, as a rule, improvement in existing technology, or even simply to ensure the visibility of a union between science and industry, so dear to the high leadership.

[Caption] The determination of various thermophysical and thermodynamic properties of inorganic compounds is purpose of a quadrupole mass spectrometer instrument, operating at the laboratory for experimental thermochemistry at the USSR Academy of Sciences Thermocenter. (On the left, scientific associate N. Ryzhov; right, A. Nasretdinov, graduate student at the Physical

and Technical Institute) The quadrupole mass spectrometer, manufactured by the USSR Academy of Sciences Scientific and Technical Association, was intended for studying the structure of the vapor of a substance according to the unique "visiting cards" of molecules—mass spectra. From the moment of its creation in 1982, the instrument entirely conformed to the world level. However, growing demand for the scientific apparatus outdistanced the possibilities for improving the instrument, due to the fact that our industry is currently unable to supply the necessary components, stock items and equipment. Today, the stability of the mass spectrometer's electronics is clearly inadequate and, moreover, similar foreign instruments are maximally computerized, which cannot be said of ours.

Is it possible to radically change the training of scientific cadres? How can the scientific life of VUZs be enlivened? It is hard to answer these questions simply, but I think it would be expedient, along with a certain reduction in the number of VUZs, to provide for the effective replacement of the professorial and teaching staff by inviting specialists with result-oriented experience from academic and departmental science, as well as first-class engineering and technical employees from industry. The right must be granted to these people, and only to them, to attract talented VUZ graduates and outside specialists for work on the faculties. Probably, the principle of scientific leadership, already mentioned, having entirely entrusted the employment of young cadres to the department leaders, should be implemented here as well.

In this regard, it is probably worthwhile to decisively reject the traditional system of coordinating cadre decisions with authorities, far removed from the essence of the work and which evaluate the candidate according to their own criteria. Thus, in particular, it is time to realize that a young person with excellent capabilities for social activity far from always turns out to be a result-producing scientist. That talent alone is grounds for entry into science.

Today, as a rule, all departments have a Main Administration under the leadership of one of the deputy ministers, to which the scientific organizations, institutes, laboratories, etc., are subordinate. With rare exception, this main administration is headed by an experienced, skilled bureaucrat, who orients himself successfully among all the reversals of fortune of ministerial work and who, in a number of cases, has a scientific degree, but has never seriously worked in science. Therefore, he has neither the name, nor the scientific authority, nor knowledge about what science really is.

The main administration personnel master the difficult art of apparatus life to perfection: it is the so-called headquarters for science in the sector. This headquarters also determines the direction of its own scientific centers' work, implements cadre policy, and solves material support problems according to priorities which seem obvious to the department leadership.

To this day, nothing of the kind has been observed in culture, art, and literature. Let us give credit to the representatives of these spheres, who, inspired by the restructuring being carried out in the country, rose up against the bureaucratic world and created their own social structures, and who are trying (sometimes successfully) to determine the policy for their own development themselves. The science sector is in need of approximately the same thing. However, nothing like this is happening here. The director of any departmental scientific organization and the scientists who work in such a collective continue to remain without rights to a significant extent. In a number of cases (let us call things by their proper names), this has led to the definite reshaping of scientific sectorial centers into quasi-scientific organizations. Moreover, today a remarkable number of departmental institutes are either a superstructure for the department apparatus, or a superstructure for some sort of production structure. These institutes have virtually ceased genuine scientific work. Yet, all these quasi-scientific organizations and their workers are included in the overall scientific system, without, of course, making any noticeable contribution whatsoever to science.

Departmental science, highly significant on the whole, would achieve far more if freed of the sectorial apparatus's petty bureaucratic supervision, and if truly great researchers joined its leadership.

Now, about the higher echelons of scientific power, above all, the role of the USSR State Committee on Science and Technology (GKNT), which is supposed to determine the most effective paths for scientific and technical progress. It seems, the appearance of this agency was useful in its day. In its work, the committee directly supported departmental science and solved various problems of an interdepartmental nature. The unquestionable merits of the GKNT include the systematization and organization of a number of scientific and technical research projects.

However, this department also failed to escape the process of bureaucratization: originally fairly modest in number, the organization apparatus began to increase the number of sectorial subdivisions and brought them to the current extraordinary number, including an enormous administration for foreign scientific and technical ties. In the end, all of this seriously complicated the GKNT's work and essentially converted it into a bureaucratic adjunct to the USSR Gosplan.

The principle, idolized by the GKNT, of planning and programming everything and anything in science is not far removed from bureaucratic scholastics. With the Committee's blessings, endless programs for "most important," "comprehensive," and "priority" scientific research and development work have recently flourished vigorously, and enormous official work is being done both to draft the programs, as well as to endlessly coordinate and approve them, which does not, as a rule, keep the programs themselves from remaining unfulfilled. The specialists involved in this Sisyphean labor

understand full well that planning within a rigid framework of stages, given the diversity of partners in research and development work, as well as the usual ambiguity in the relations of financial and other material and technical provisions for the programs, sooner or later leads to a sad result. However, as often occurs, even here the well-arranged bureaucratic mechanism found a way out of the situation: at the critical stage, when the impossibility of fulfilling the previous program becomes clear, it switches to drafting a new program.

Perhaps this assessment seems excessively sharp, but I am deeply convinced that what was said is just, and I think it is necessary to speak precisely so.

The Academy of Sciences, the oldest scientific organization, created about 300 years ago and playing a special role in our scientific life, also determines the development of science in our country. I would say that today the academy is a kind of ministry of science.

A different definition of the USSR Academy of Sciences exists—the “headquarters of Soviet science,” meaning that attention is given, above all, to basic directions and only to a certain extent to applied disciplines. The real picture, unfortunately, is entirely different. In recent decades, the natural sciences subdivisions of the Academy have been making an especially large, perhaps even excessive turn toward applied science.

The significance of applied sciences in our time has increased so much that the Academy does not have the right to deviate from conducting a number of corresponding studies, yet not to the detriment of basic science's priority.

There are also attendant factors which intensify the state of affairs. I shall illustrate this with only a single example. As everyone knows, all of our country's vitally important problems—improving the economy, agriculture, and medicine, developing contemporary technologies, etc.—are accompanied by the various resolutions of leading party and state agencies. Of the organizations specifically responsible for fulfilling the corresponding regulations, along with the departments, as a rule, the USSR Academy of Sciences figures in all of these resolutions, becoming, I will allow myself some exaggeration, an extraordinarily “convenient” agency for the leading agencies, since it “consecrates” virtually any of their resolutions with its authority. This circumstance is already forcing academic organizations to respond specifically to an enormous number of different problems which, as a rule, are not characteristic of them. However, reference to the Academy of Sciences automatically makes it necessary to prepare numerous documents, most often of slight significance, but taking away masses of time and seriously distracting the leading employees of the Academy from their immediate task—the direct organization and leadership of scientific organizations.

[Caption] The “Laser Fluorescence” instrument, operating at the Institute of High Temperatures since 1981, is

intended for studying the spectra of low volatility compounds, for example, rare earth oxides (near the instrument, one of its creators, A. Kulikov, candidate of physical and mathematical sciences). Similar systems are available for scientific institutions in four other countries: the United States, Canada, the FRG and France. However, our instrument does not compare favorably with the foreign level. For example, the laser used in it was acquired in the United States almost 15 years ago and should have been written off as obsolete long ago.

Maybe my claim seems debatable, but I am certain that the Academy of Sciences, its institutes, and its powerful creative potential in the person of the greatest scientists, should use extraordinary caution in becoming involved in immediate problems, particularly when it relates to solving partial problems. Otherwise, the process of academic science's participation in the country's life will be entirely bureaucratized.

I am quite familiar with the work, for example, of the Academy departments, which unite the most skilled representatives of different scientific fields, as well as with the activity of practical bodies—the bureau, in which the most capable members of a department are concentrated. What does this bureau work on? Above all, on problems related to the endlessly changing forms of planning. However, planning, calculated years in advance, is often absurd for academic science, which requires free exploration. If such is lacking, if opportunities are not created for exploratory studies, which are often related to debatable ideas supported by far from everyone, it is hardly possible to speak of opportunities for serious, long-term basic research.

I think that, without rejecting planning in general, including that of the basic directions, it is worthwhile in principle, without petty regimentation, to devote greater attention to attempts to formulate more interesting, including specially exploratory, directions. Apparently, the time has come to create a climate for the fair evaluation of exploratory research results, in order to validly assess both successes, as well as failures.

Perhaps, in time the analysis of proposed exploratory work and the evaluation of the results of one scientific research project or another will become the main direction of work both for the departments, as well as for the Academy of Sciences presidium. Meanwhile, most unfortunately, we are working entirely inadequately on the exploration for and support and implementation of new ideas.

The problem of the aging of science, already mentioned, is extremely topical for all of the academic structures as well. The venerable age of scientists and of many specialists on the virtually permanent staff of academic institutes cannot help but evoke serious concern. We greatly need a variable contingent of specialists, entering academic institutes for several years for definite, clearly formulated research and leaving after completion for

other organizations, in order to put the obtained results into practice or in order to continue work.

As everyone knows, specialists of this kind have appeared in the institutes: probationers, who, according to the idea, are supposed to be a variable contingent in the institutes. However, in time they became essentially indistinguishable from the typical scientific associate, given the simply insignificant number of probationers themselves.

It seems that a significant part of the collective, for instance, one-half of the workers, could become a variable contingent. People who have proven themselves brilliantly in one scientific field or another, great personalities, surrounded by a relatively small number of associates and service personnel, would remain on the permanent part of the staff. This is a permanent core which, unquestionably, will begin to attract capable young scientists, who will come to the institute for a while in order to implement one exploratory idea or another. This is a very important problem which warrants, it seems to me, serious consideration not only among specialists, but also in the broad public.

Relatively recently, appreciable changes were made in the Academy Statutes and the regulations on its operation. It was already noted that the sections of this resolution on the age limit for leading employees and members of the Academy is a very timely initiative by the new USSR Academy of Sciences leadership.

However, not everything in the renewed regulations can be unquestionably accepted. Thus, the part concerning the election of new Academy members to fill vacancies, left by academicians who have reached the age limit, sparks definite doubts. In and of itself entirely acceptable at first glance, part of the new regulations can lead to an extraordinary increase in the number of Academy of Sciences members. The last elections, in which about 250 new academicians and corresponding members were brought into the Academy simultaneously, graphically illustrated this possibility. It is fairly easy to assume that in a few years the USSR Academy of Sciences membership will number 500-600 academicians and more than 1,000 corresponding members. Now already, to put it frankly, the appearance of persons, who clearly have not achieved the intellectual and moral level expected of members of our country's Academy of Sciences, in the corps of academicians and corresponding members is noticeable. In this regard, perhaps, it is worth limiting membership in the Academy to a somewhat reasonable number, for instance, 250-300 academicians and 500 corresponding members.

Having mentioned the elections, I cannot help but note that highly respected specialists, holding one or another high post in soviet or state service, often actively strive to get into the Academy of Sciences. It is highly deplorable that they believe it possible, in this regard, to use their official position or the influence of still higher leaders in order to support their candidacy, or in other

words, to directly pressure the Academy members during the elections. True, definite progress has been achieved in the past decade—some employees of the state and party apparatus are not allowed to participate in the elections. However, as often happens, they are finding ways to overcome even the strictest prohibitions.

As far as the situation surrounding the elections or the procedures for them is concerned, I will not conceal that it is embarrassing to even write about certain particulars. Several months before the beginning of the election campaign, the claimants begin to directly assault Academy members with suggestions (often very impolite) that they become familiar with the aspirant's talents or with the organization that he heads, etc. In the next stage, the aspirants' interest shifts toward extracting "recommendations" for selection, toward organizing support both on the part of individuals, as well as of organizations where Academy of Sciences members work. This, if one may so call it, pre-election campaign creates such a tense atmosphere that any self-respecting Academy member tries, for instance, to "fall ill" or leave on vacation, in short, to disappear during the election period.

I would really like all of us to think again about the scientist's role in our country and remember how Russian science has always been distinguished by high authority among the people. In prerevolutionary Russia, two poles allegedly existed: on the one hand—illiteracy and low culture and, on the other—the profound knowledge, high intelligence, talent and morality of the advanced representatives of society. The development of literature, painting, music—all of this combined to create remarkable scientific schools. The excellent traditions of our science, its authority, democracy, and moral values were supported and augmented in the post-war years, regardless of the tremendous difficulties that the country suffered at the time.

Unfortunately for us, the Stalinist period, having started the "witch hunt" with notorious anti-human trials, led to the rapid utter defeat of the Soviet intelligentsia, right up to the physical annihilation of many outstanding scientists. However, even under these improbably difficult conditions and also in the difficult time later, the role of Soviet scientists often went beyond the framework of the purely authoritarian use of extracted knowledge. The most worthy representatives of our society rallied around the outstanding representatives of science. In this regard, it is impossible not to mention the courage of Academician P.L. Kapitsa, the unswerving defense of scientific truth by academicians V.A. Engelgardt, N.A. Leontovich, and I.Ye. Tamm, and the keen sense of social justice, high moral principle and self-sacrifice of Academician A.D. Sakharov. These people, who have done an extraordinary great deal for science directly, have, at the same time, not tolerated the destruction of its moral foundations, serve as an example for a large number of young scientists and the entire Soviet intelligentsia, and have helped cleanse our society of filth.

Right now, when major repairs are being made to that which we created during the 1970s, we should also fundamentally renew our science system. I will not insist that the entire above analysis or, moreover, the expressed proposals, are correct, yet I am certain that restructuring in science is necessary, that we have not yet seriously started this work, and that we must do it without delay.

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Academician Kosygin on Inadequacies of Academy Electoral System

18140302 Moscow IZVESTIYA in Russian
25 Jul 89 p 3

[Article by Academician Yu. Kosygin, Hero of Socialist Labor and Lenin Prize winner, under the rubric "Science and Restructuring": "Not by Number, But by Intellect, or on Whom We Elected to the Academy and How"]

[Text] I completely share the anxiety of Academician Likhachev about the moral state of our scientific community (IZVESTIYA, No 84) and am very afraid that the fate of this extremely topical publication might also be of that sort: they read and forgot it. I would not want to, since we have nowhere to get away from the questions raised in the conversation—sooner or later it will be necessary to take specific steps. Better sooner. Or right now, when the questions of the forthcoming election to the academy are being actively discussed in scientific collectives. What can be more fundamental for every scientist and in the end for the interests of the country? But....

How do we elect people to the academy? The number of vacant units and their breakdown by specialties are published 2 months before that. Bare units, without people. True, someone in management also clothes them in advance in human flesh. But we rank and file academicians for the present know nothing about this. Why have the units been broken down this way, and for what is it necessary to break the units down in advance into specialties? Is it not better to elect simply scientists, who are earnest, have given a good account of themselves, and are well known without fail to the scientific community?

Let us note that according to the wording of the charter of the academy scientists, "who have enriched science with outstanding scientific works," are elected corresponding members, while those, "who have enriched science with works of paramount scientific importance," are elected full members. During my long years at the academy I have never discerned the difference between these two wordings. Taken separately, each of them is still heard somehow, but together they are a kind of verbiage; in any event there are no criteria of distinction in them. It would be possible to word them as follows—"it is possible to elect to the academy whomever you wish and to elect anyone as corresponding members."

The trouble is that in both of these definitions there is no criterion of the evaluation of a scientist. But when vacancies are announced, it is necessary to fill them with candidates. Provided they are suited for the specialty. And now the election campaign begins. The councils of scientific institutions and higher educational institutions, state and public organizations, academicians, and corresponding members begin to nominate with the appropriate substantiations (is it difficult to compose them?) candidate members of the academy.

The qualitative spread of the candidates is very broad. An academician must nominate his own closest associates, who are useful to him, are needed, or are agreeable; scientific councils and organizations usually nominate their own (the main thing is that they would be their own) staff members and instructors, as a rule, but not necessarily with a doctoral degree. Then a stream of requests for support comes rushing down on us and on our institutions. Detailed biographical data with the epithets "major," "outstanding," and so on are often reported here.

For what is this necessary? This is necessary in order to report the merits of the scientist being nominated. After all, often no one knows him. He is unknown. For we frequently forget that a person running for election to the academy should already be well known in our country, while an academician should also be well known far beyond his specialty. Requests for support are sent out by those (well, of course, on behalf of an institution), who are unknown or little known and who if only for this reason should not be elected. But what is one to do? Why offend a person? Of course, one must give support, especially as no one will subsequently be interested in these supports, they will be inviolable, will lie in files of the presidium, and do not play any role at all. So why not give support?

Back in the 1960's the charter of the academy provided for the publication of the nominated candidates in the central press no later than 15 days before the election. Then one of the academy bosses many years ago declared that one ought not do it this way, since too many candidates get nominated merely to see their name in the central press; it is necessary to publish the lists in the bulletin of the Academy of Sciences. And they began to publish them in the bulletin, barely being in time for election day. (I said "get nominated" not by chance, for it costs nothing to ask an acquainted corresponding member, academician, or director of any institutions for this: "Nominate me, please, this does not cost you anything." Indeed, it costs nothing. And they nominate. It is this that "to get nominated" means.) What 15 days these are there! The bulletin with the list is delivered to members of the academy literally before the election assembly itself, but what about other scientists? Do they really not care at all about the election to the highest scientific organs of the country? Pardon me, this is also their immediate concern. They have the right to participate in the building of the academy. But they have been

deprived of the opportunity to express their opinion and even do not know whom they will elect.

I say "they," because there ought to be elected scientific "leaders," whom "they" will follow and whom "they" consider worthy "to supervise them." I do not want to cite the hackneyed words which became so familiar in the press and in statements, especially as one does not sense glasnost and democracy here. The election to the Academy of Sciences is a national affair. It closely concerns the entire scientific corps of the country. But correspondents of central newspapers were not even admitted to the last election assembly in December 1987: Why wash dirty linen in public?... We will somehow manage ourselves without correspondents.

Incidentally, about December. In the 1960's we voted in the spring, then in the fall, until we became firmly fixed on the last 10 days of December. The assemblies take place, so to say, under the New Year's press: it is impossible to turn back, the end of the year is ahead, while the assembly for some reason should be held without fail, contrary to all logic, precisely this year. It must, you see.... But why precisely at this time?

And now the election assembly begins. First the one of the department, then the general assembly. The scientific community of the country does not have an idea of the supposed candidates. Especially those who get nominated for vacancies of the regional departments. It is believed that they are needed, if, let us assume, they have been nominated for the posts of directors of institutes or are already directors or have been nominated to plug some other scientific organizational hole. But they are unknown as scientists. The logic, on the other hand, is well known: there, in the provinces, things are more evident to the authorities. And they elect them. And they wish them success at an alcohol-free banquet. I do not want to soil the election. We also elect worthy scientists, there are quite a number of them. But at the same time we often also commit thoughtless acts. The result is already at hand. A filter of the scientific community at large, if only an audience of the professorial and doctoral ranks, is needed. Considerate timely exchanges of opinions are needed, objective appraisals at the democratic level are needed.

But what is the very election procedure worth? In recent years we have been meeting at Moscow State University. There it is more spacious and not as stuffy as in the crowded corners of the House of Scientists on Kropotkinskaya. We stand in lines for ballots. We sign our name, and then, due to the lack of a voting booth, even voting tables and any seats, the academicians, as a rule, vote, having pinned the ballots with their palm to the palatial marble walls of Moscow State University. This is so awkward, at times so difficult, that many academicians drop their ballots into the ballot boxes, without having crossed out either the word "elect" or the word "reject." What is to be done with such ballots? And here they got an idea—to count blank ballots (and there are many of them, what is more, so many of them!) in favor

of those who are elected. Here a completely unlawful action is being committed, and one must not consider these ballots as votes "for," but they do, and it turns out magnificently. A handful of individuals are rejected, but, in essence, tens of candidates ought to have been rejected. But this seems inhuman, and for this reason they toss the blank ballots and formulate a devil-may-care and indifferent attitude toward the voting procedure, opening a little the crack, through which the members, who have been newly brought to light, slip. Is this good? This is very bad. But what is one to do?

I believe as follows: it is necessary to direct attention not to vacancies, the empty units, to which bureaucracy has given rise, but to specific people. It is necessary to nominate the scientists, who are actually worthy of lofty titles, it is necessary to nominate them most openly, where possible with publications in the press and with reports of the scientist on his scientific results and program, which are accessible to the audience at large, to nominate them at any time of the year entirely regardless of the date and vacancies, deliberately, and without haste. It is possible and necessary to nominate scientists who are well known in the country.

And afterwards, when it becomes clear that these scientists will enrich the ranks of the academy and will protect it with their knowledge and energy against fading and mediocrity, to fix the assemblies. And to settle the question of the election of these already well-known candidate members of the academy, who have passed through the mill of public discussions and the press. It is necessary that before the election they would display their books, developments of new designs of machines, or basic and already fruitful developments of fundamentally new technological systems. This is mandatory. Because bibliographies with their many tens and hundreds of works mean hardly anything, since they include short articles, newspaper publications, abstracts, editing, forewords, and so on, while the words "he has about 200 scientific works" causes the uninitiated some reverential quivering. It has a ring, but it might also not mean anything. It is necessary to show something to advantage, and not as a figure. I recall that in 1964 one candidate corresponding member had more than 150 works, but at the general assembly it turned out that these were entirely newspaper articles and nothing more.

So it is necessary to ask to take part in the election people, who are thoroughly prepared for this and have been approved by public opinion. Empty places will always be found for them at the academy. But if it does not happen, it is possible to ask, while it is also possible to wait. The academy now needs not the quantity, but the quality of scientists. The development of the fields of science does not depend at all on the number of people, who have receive the title of corresponding members or academicians. Therefore, it is necessary to elect a person, and not to fill a vacancy. This will be an important step against the turning of the academy into a bureaucracy.

Medical Official Argues Against High-Cost Research Programs

18140301 Moscow PRAVDA in Russian 12 Jul 89 p 2

[Interview with Boris Borisovich Yegorov, director, USSR Minzdrav medical biotechnology scientific production center, doctor of medical sciences, by Igor Mosin: "Know How to Say 'No!'. Science in the Contemporary World"]

[Text] The situation is unusual even in our time, rich with unordinary events and turns. B. Yegorov, director of a USSR Minzdrav medical biotechnology scientific production center, is categorically protesting against confirming the possibility of creating new medicinal substances in space. Let me clarify: besides its basic tasks, the center that he heads has been assigned the head role in the country for space biotechnology in the interests of health care. Let us recall: Boris Borisovich himself was the first doctor to go into space, a Hero of the Soviet Union, and doctor of medical sciences. Right now he is working most actively, to put it crudely, to chop off the bough, refusing additional financing for space research. Why?

B. Yegorov: Enough, finally, of fooling ourselves. Reread the notes and articles on space biotechnology. They are written so that it seems like the cosmonauts will free us from many painful problems any day now: they will provide unique medicines, plants that give unprecedented harvests, and super-pure and super-modern technologies. Since I am "sitting" on this subject, such promises give me a toothache. The matter is getting to specific cases. What haven't they promised to obtain in space? Insulin, a cure for colds, and savings of billions for the national economy.

Those who work in this field catch up the "miracle in space" with particular willingness. You cannot figure out who is heating up whom—first the specialists heat up the press, then the press—them. I note that "earth" scientists in the field of biotechnology treat this hullabaloo with a fair amount of restraint. They well realize that we will not obtain any kind of rapid yield from space industry whatsoever in the near future. So, maybe it suffices to work on space myth-making? Unfortunately, neither we, nor the Americans have for the present time created even a single medicinal preparation thanks to astronautics, such that it could already be used for practical purposes today. This is a task for the distant future. However, we must talk about this honestly, and not promise hills of gold from day to day.

PRAVDA: Boris Borisovich, why do you raise the question so sharply precisely today? After all, excuse my directness, but as a specialist you could not have helped but understand this before?

B. Yegorov: I have always supported this position and stood up for it. I sent letters to the leaderships. I spoke out at conferences and symposia. For a specialist, my viewpoint on space biotechnology research is no secret. Five years ago, they tried forcing me to start work to

create a space biotechnology plant. A report had flashed somewhere in the press that the Americans had already developed such a project. Its cost was \$175 million dollars, yet a profit of billions of dollars was allegedly expected. Ours began to rouse themselves as well: the Americans, they say, are no fools, they know how to count money. We should too. I barely managed at the time to prove that this was a senseless undertaking, from which nothing would come. Incidentally, across the ocean they also decided not to embark on its implementation. Just imagine, if I had not succeeded in persuading them? What we would have today is a space analogy to the river redirection or Leningrad dam projects.

PRAVDA: Your position today is close to that of a great many. As if from within, you are corroborating the dissatisfaction with our space work that has accumulated in society and is splashing out into the light now. Really, how many space devices have we launched, how many people have we sent there, and is the real outcome adequate? You must agree, there is something abnormal when a society cannot arrange the output of elementary hospital bedpans, but is then prepared to send a foreign journalist into space.

B. Yegorov: Let us place the accent properly. I am for astronautics, the further mastery of space and research there, so to speak, with both hands. In this field, we have a great deal of work in progress, and I see no sense whatsoever in rejecting it. This is side-stepping again. Defense, they say, is not needed, let us convert it to produce sinks. Space is not needed, instead of rockets let us now produce disposable syringes.

Astronautics is an extraordinarily profitable sphere of activity. Every dollar that the Americans invest in it brings 13.00 dollars profit. We simply have not learned to use our existing wealth properly. Let me remind you that astronautics includes excellent satellite communications, the reconnaissance of fishing reserves, weather forecasting, observation of the ecology, prevention of fires, and conduct of scientific research for the long-term future. The Americans accept money for all of this, and a great deal. Here, one does not even understand who pays, to whom, for what and how much. Hence, the common dissatisfaction with space research. It is unclear, they say, where the money goes and what kind of results there are. Under the present economic interrelations, it really does disappear like water into the sands.

Moreover, I always support initiative in converting our astronautics onto commercial tracks. Since we have formed such a powerful extraterrestrial industry, let us use it sensibly and extract a profit from it. Right now, we need hard currency so badly. We should not convert the sector to some other kind of track. After all, producing disposable syringes (the specialists know) is a fairly specific undertaking. I personally cannot imagine how it is possible to convert satellite-producing technologies to medical instruments. The conditions, technologies, equipment, and components are entirely different. It is like demanding goat's milk from cows.

It is like milk, but it is not at all the same.

I even support launching, for instance, a New Zealand shaman into space, if only he pays well for our services. With the money gained, we could build plants to produce the most modern equipment and purchase the most advanced technology. I am sure that this will cost us far less and be more profitable than reorientation. Do not forget, that in the world we and the United States essentially have a kind of monopoly on space. So, let us capably utilize this situation, which took shape historically. I am certain that astronautics will not only pay for itself repeatedly, but will return everything that it owes to the national economy with interest. Incidentally, the role of NASA in the Apollo program was reduced to carefully coordinating the efforts of approximately thousands of contractors, who desired to obtain practical results from its implementation.

PRAVDA: How many times in our age have we heard already: "Just give us the money, and we will repay it to you, that is to say, to the national economy, after a few years or a 5-year period—depending on the scale of the project—a hundredfold." They took—for chemicalization, robotization, for uplifting the Non-Black Earth Zone, for the Food Program, and for space. Alas, the time periods expired long ago... After all, you are not protesting against space biotechnology for nothing. Naturally, public opinion regards various kinds of programs with increasing distrust. Studies by scientists stand behind all this. The dissatisfaction with science, particularly economic science, was clearly displayed at the Congress of People's Deputies. Four years of restructuring have passed, but where are the real results? Where is the new anti-expenditure economic mechanism? In short, how is it that we give scientists the credit of trust, yet they do not hasten to justify it?

B. Yegorov: You are raising a very important and very painful question for domestic science today: scientists' responsibility to society, in the broadest interpretation of the word: financial, social, political, and civic. It must be admitted that right now under the existing command administration-economic system scientists do not in practice bear personal responsibility for their actions. As a result, they give the OK to construct plants and dams that destroy rivers and lakes, to lay railroads that end up not being needed by anyone, and they issue laws that do not work.

In principle, apparently, it is possible to explain this irresponsibility somewhat. A historian, I think, would recall the 300 years of the Tatar-Mongol yoke, the prolonged Tsarism, and later the cult of personality, which from generation to generation annihilated everyone capable of thinking and resisting. An economist would refer to the command-bureaucratic system that has formed, which does not need individuals, but cogs. A sociologist would say that in our society science has never played a decisive role and that its recommendations have been heard, but not always followed.

This is all true. However, after all, understanding this does not make things easy. The question is how to break this tendency, how to break the mentality of the little person, the person without an opinion in science? One of the publicists put it well: we did have stagnation, and it was not stagnation of machine tools, but stagnation of people. A profound thought. I think that success of the external changes which are taking place in our state—the new economic mechanism, new laws, cooperatives, joint enterprises and much else—will depend on the internal transformations that occur in each person. The process of this social maturation is extraordinarily difficult and torturous, both for each person as an individual, and for society on the whole.

Remember how many ardent, angry speeches there were at the Congress of People's Deputies against the sadly infamous Article 11 of the notorious Ukase. Our society has paid too steep a price for the impunity and arbitrariness of certain bodies of power. The amendment was finally abolished. However, we all saw what kind of effort this took on the television screens. The bureaucracy will not yield without a struggle. Each step of society along the path of democracy and glasnost will be made with colossal labor. We must realize this and be prepared for it.

However, any path can be crossed either more rapidly, or more slowly. Our movement along the path of restructuring, democracy and glasnost depends on the internal readiness of each of us. Finally, right now is a time when each should decide for himself: with whom is he? The most important restructuring is our internal, spiritual, and individual restructuring. If a person decides that starting tomorrow he will become like a flint and put all forces into his own specific place, in order to genuinely live and work, and not play at democracy and restructuring, then things will work out. Today everyone must learn to say: "No!" No to foolishness, red tape, bureaucracy, compromise, and baseness. No matter how difficult or hard it may be. The more people who decide this, the more rapidly society will gather the critical mass and all of our new laws, economic mechanisms, and joint enterprises will start turning around. In the final attempt, everything depends precisely on the person. He is also capable of escaping from his stagnation.

I speak of this with such alarm and pain because, it seems to me, right now we are all on the whole undergoing a certain moment of uncertainty and internal disillusionment. The 5-year period is coming to an end, but results, to put it lightly, are scanty. Some are looking back to the stagnant times with nostalgia. The future is unclear. I am convinced: society needs powerful stimuli and pushes in order to move forward. It cannot be in a waiting state for long, or we will inevitably begin losing the positions which were gained.

Under these conditions, the voice of scientists acquires particular significance and weight. In the final account, they are responsible for society's movement forward. A great deal depends on their current position. Why do I

protest space biotechnology? With its help, some day it will be entirely possible to obtain wonderful medicines that mankind can only dream about. However, as a scientist I realize quite well that neither today, nor tomorrow, will we have these medicines. So, maybe it is more sensible to spend this money, as you commented, for the production of bedpans or disposable syringes? We must do science with our hands clean: enough of dispensing unfeasible promises at any level. I will be happy to continue experiments for medicinal preparations in space, if I were sure that they were needed by society and that it approved of them.

Sometimes one wonders: space biotechnology research, in terms of its scales, is not the construction of the BAM or land reclamation. However, how many of them, of these unnoticed works, exist on state scales? How we love to draft programs, make promises, and later quietly bury everything. Right now in Moscow the routine program "Progress-95" is functioning, and in Leningrad—"Intensification-90." How many of them have there been already! There is a great deal of noise, and a great deal of funds has already been allocated to them, but as regards results, I am not convinced. Is it not time for us, for each person in his place, to begin to struggle against absurd programs, unfeasible promises, long-term plans? We must live and struggle today. Then tomorrow we will have that which we ourselves create, and not that which they planned for us.

PRAVDA: Nonetheless, I cannot agree with you on everything. Every family lives with an eye toward the future. Tomorrow we will buy a "room divider," after tomorrow, an automobile. How can it be otherwise?

B. Yegorov: I think that planning should be replaced by forecasting. It is impossible to plan society's life many years ahead. We are herding ourselves into frameworks that later become crowded and uncomfortable for us. Why did the present 5-year period fail? Indeed, because we tried to fill an old form with a new content. A dissonance arose. One ought to conform to the other. I am in favor of setting goals, but let each decide for himself how to pursue them. We are putting the brakes on progress with planning and the distribution of funds, limits, and resources.

You probably remember that quite recently the world was shaken by several scientific sensations—cold fusion, the biological memory of water, and room temperature superconductivity. Specialists have predicted that each of these discoveries is capable of bringing society to qualitatively new turns of development. Let us assume that their predictions would be confirmed. However, how would we use the results of these achievements, if plants have a plan until the end of the 5-year period to produce motors and they are exhausted, but have to fulfill it? Our economic structure is not receptive to science's achievements. If tomorrow, by some kind of miracle, we thought of something that would allow us to compare ourselves to America in terms of living standards, I am sure that this innovation would not be

accepted in practice. First, they would say, we must finish the head program and then the 5-year plan. Why?

Incidentally, as our press later reported, both cold fusion and superconductivity were discovered years ago by our scientists. However, as usual, they and their discoveries were ordered about and ordered about and then forgotten. Right now, the Academy of Sciences is seeking funds to do research along these directions. In all the newspapers and magazines they write: sensation of the century, a turn in science. In truth, no man is a prophet in his own country. Admittedly, I am extremely embarrassed and pained by this unique mentality of imitation of and orientation toward the West. We have conceived of a calming formulation for ourselves of the type "the capitalists know where to invest money, they do not throw it to the wind." Incidentally, we also sought money for cold fusion and superconductivity and are doing research in these directions. How can we lag behind, after all, the whole world is going in this direction! Yet, are we ready to use the results of this research in practice? After all, the technological level of our society's development is far from that of the Japanese. Maybe it would be worth waiting to see what they come up with and later decide where and how to go. For instance, would it not be simpler to just up and buy these technologies? I am convinced: so long as we do not realize that we must live according to our own minds and have our own path of development, we will not rid ourselves of many shortcomings.

PRAVDA: Yes, there are more than enough problems. And with everyday, alas, their quantity does not reduce, but rather to the contrary... Do you personally see no way out for society in the situation that has taken shape? Would scientists be able to contribute more rapidly and radically to solving the imminent problems?

B. Yegorov: There is a good saying in the military: "Better to make the wrong decision, than to make none at all." Possibly this is not a cure for society on the whole, although you cannot reproach us for modesty in terms of incorrect decisions. However, I am quite sure that our main problem is a half-way policy and indecisiveness about forward movement. As though everyone had agreed that we had no other way, but we are following it extremely uncertainly and timidly. Society suffers from this still more.

On the global plane, I think, the main thing is to grant maximum management, legal, and economic freedom to enterprises and scientific organizations. A specific example—science. Work has become somewhat more interesting. Forms of labor organization which are entirely new for our science are appearing. For example, on the base of our center, we are creating a joint enterprise with one of the defense organizations for the output of an immuno-ferment analysis instrument. It is irreplaceable in diagnosing AIDS and cardiovascular diseases. It costs 10,000 dollars on the world market. We are trying to saturate our medical institutions for rubles, plus we are trying to sell it in the West. We are planning to develop

our own research again on the funds gained. And this is not the only variant. Was it really possible to even think about this before?

However, a mass of problems exists in science itself, regardless of the fact that it has become somewhat easier for it to breathe. State orders are unprofitable for us. The maximum profit that we can receive from them is limited to 10 percent, and on economic contracts—40 percent. Naturally, scientists will avoid state orders one way or another.

What influence can science have on society's fate? This process is interdependent. You justifiably reproached scientists for not having given the national economy new technologies, equipment and preparations. The paradox lies in the fact that all of this does exist in one or another form, at one or another level or quality. However, to this day, so long as there is no public need for the ideas of scientists, there is no point in speaking of any kind of breakthroughs, advancements and of outdistancing our rivals. To this day, the economy is not receptive to scientific and technical progress. This is sad, but a fact. One of the classic scientists in his day said that technical necessity advances science more than dozens of universities. You cannot avoid this.

However I am sure that as soon as competition becomes the standard for our life and a need for ideas appears, we will be fully able to witness the "Lomonosov effect." We have a colossal scientific potential and a mass of brilliant minds yearning for genuine work. We need only let these forces spread their wings and realize themselves. Believe me, they are capable of a great deal.

GKVTI Official on Conflict of Interest With Computer Cooperatives

18140295 Moscow PRAVDA in Russian 15 Jul 89 p 2

[Interview with Vyacheslav Vladimirovich Korchagin, deputy chairman of the USSR State Committee for Computer Technology and Information Science and president of the Informatika Cooperative Union, by Ye. Sorokin: "'The Cause Is Worth My Suffering.' A Deputy Minister Manages a Cooperative"; date and place not given; first two paragraphs are PRAVDA introduction]

[Text] At the end of last year the Informatika Cooperative Union was established in Moscow. Deputy Chairman of the USSR State Committee for Computer Technology and Information Sciences V. Korchagin became its president.

Barely had this report flashed by in the press, when our editorial telephones became hot from ringing. The first wave had only just subsided, when a published report and a television story on millionaire cooperative member A. Tarasov added fuel to the fire. "Find out from Comrade Korchagin," a woman said sarcastically into the receiver, "for how much is it now possible to buy a deputy minister?" "This is a genuine superintendent of restructuring," acquainted cooperative members said,

"who understood that only the cooperative form of ownership is capable of getting our economy out of the crisis." Many letters—contradictory ones, perplexed ones, often with diametrically opposed opinions—are arriving at PRAVDA. All right, the fact is truly extraordinary. But rather than contemplating and guessing, we decided to question V. Korchagin himself about everything.

PRAVDA: Vyacheslav Vladimirovich, what state tasks is the State Committee for Computer Technology and Information Science, of which you are one of the executives, called upon to accomplish?

V. V. Korchagin: You will not answer this question in brief. The system of the informatization of society is one of the main directions of scientific and technical progress. The ultimate goal is complete or, if you wish, all-round computerization. Thus far the very concept of informatization has not yet been completely elaborated. One thing is clear: it should have data on all aspects of the activity of man. Moreover, actively working data.

I am prepared to talk a long time on this theme, but, I see, other questions interest you.

PRAVDA: You are right. The point is that executives of such a high rank as you are usually do not consider it possible for themselves to "get involved" with cooperatives. But you gave your consent even to become the president of an entire union.

PRAVDA: I am worried least of all about what people will say about me. The president is an elected and unpaid position, I will not accept any "presents," so my conscience is clear. But since, as you said, I am a state official, I should think first of all about the interests of the country.

PRAVDA: What kind of assistance are you giving the cooperative?

V. V. Korchagin: First of all I am trying to set the correct direction in its work, so that it would concentrate its forces on the accomplishment of the long-range tasks in the area of information science and computer technology.

PRAVDA: In addition to the president, in the Informatika Union there is also a chairman. He is I. Karas, who, incidentally, is at the same time in charge of a state enterprise. Does not the "chairmanship" prevent him from performing state work?

V. V. Korchagin: As far as I know, it does not. The production volume of the cooperative and the state institution, which are headed by the same person, since last year has increased by more than twofold. The gained experience of such work helped us in elaborating proposals on the establishment of a state cooperative association on the basis of the Eleks MEVTs and the Eleks Cooperative and a number of other organizations and cooperatives.

I believe that the success of restructuring lies not in the opposition, but in the intelligent combination of the state and cooperative forms of ownership and the organization of labor.

I greatly appreciate the confidence of the representatives of more than 40 cooperatives, who voted again for my election as president, now of the Informatika All-Union Cooperation Union.

PRAVDA: For what is it, the cooperative, needed? Can the State Committee for Computer Technology and Information Science, while having such great powers, really not create the same conditions for work at the state enterprises that are subordinate to it?

V. V. Korchagin: Unfortunately, it cannot. Take a look: from the start the economic base of cooperatives (according to the Law on the Cooperative) and state enterprises (according to the Law on the State Enterprise) with respect to the remuneration of labor was established far from in favor of the state form of ownership. A cooperative can spend on the remuneration of labor up to 70 percent of the revenue, while state enterprises at best can spend 25 percent. Where is the equality here? True, a number of acts under the law led to the reduction of the level of remuneration at cooperatives, but at far from all of them. Moreover, precisely the cooperatives, which deal with science-intensive products and work on orders of state enterprises, suffered.

The "shashlyk makers" hardly suffered. But all the same the share of the remuneration of labor at cooperatives is significantly higher.

So we cannot violate the law, but see a way out in the establishment of state cooperative associations, of which the committee will be a shareholder, receiving a portion of the profit in proportion to the invested share.

PRAVDA: In the charter of the Informatika Cooperative Union it is recorded that "the strengthening of the financial status of its members" is one of its goals. What is the average wage at a cooperative and at a state institution?

V. V. Korchagin: I have already spoken about the differences in the remuneration of the labor of cooperative members and personnel of state enterprises. The wage of cooperative members is a commercial secret, even the members of the union are not obliged to report back to the president. The average wage of the personnel of state enterprises also differs greatly even for enterprises of the same department. One works according to the first model of cost accounting, one works according to the second model. And two associations have changed over to the lease contract.

PRAVDA: Is your election as president not at variance with the charter of the union? For you are not a cooperative member.

And another thing. It is well known that cooperative prices are significantly higher than state prices. Our readers write that cooperative members selected an entirely "legal" form of robbery of the state. They sell their services to profitable institutions. The latter pay them with checks, while the cooperative members obtain at the bank "real money." As a state official you should be interested in such a thing not happening. But you are the president....

V. V. Korchagin: You know, there are no contradictions here. I have already said that I work for free, although I could also receive money as a person who holds more than one job. This is not at variance with prevailing legislation. I receive a wage in the committee as one of its deputy chairmen. I should say that I have many other public positions.

As for the prices, many cooperatives work at state rates, but live better, because they do not keep, like some enterprises, three chiefs per worker.

As a state official I am first of all interested in solving the problems of expanding the production of computer hardware and software and meeting the needs of the national economy and the population. And as president I am interested in the same thing.

The question of the unrestrained "pumping" of noncash money into cash stems first of all from the imperfection of the economic mechanism of the national economy. It is a great pity that many acts under the law, which were adopted after the promulgation of the laws on the cooperative and the state enterprise, were essentially not subjected to broad public discussion and are imperfect in their legal essence. They often force cooperative members to seek roundabout ways and to maneuver. They also cause a wave of reader responses and create for the "nightingales of restructuring" a basis for speculations of an ultra-left orientation. Not for nothing do they say among the people: measure twice, cut once.

PRAVDA: And a final question, which, like all the preceding ones, is dictated by reader responses: Are you experiencing trouble along administrative and party lines due to the fact that you decided to head the cooperative union? What do the chairman of the State Committee for Computer Technology and Information Science and the USSR Council of Ministers, to whose nomenclature you belong, think of your decision?

V. V. Korchagin: You know, if it were not for the support of a number of responsible officials of the CPSU Central Committee, the Moscow City Party Committee, and the USSR Council of Ministers, the chairman of our committee, and the secretary of the party committee, I would not have held out long.

The results? The committee has begun work on the establishment of state cooperative associations and its own credit and innovation bank, is formulating and introducing associative principles of the consolidation of

state and cooperative organizations within the State Software System, and so on at the regional level of management.

So there is enough trouble, but the comradeship of like-minded people for the present is helping out.

Academy, Ministry Conflict Over Antarctic Research

18140282 Moscow PRAVDA in Russian 11 Jul 89 p 3

[Article by Vice President of the USSR Academy of Sciences Academician N. Laverov and Corresponding Member of the USSR Academy of Sciences V. Kotlyakov, chairman of the Interdepartmental Commission for the Study of the Antarctic: "They Agree With the Criticism"; first paragraph is PRAVDA introduction]

[Text] In the article of V. Bardin "After the Inspection" of 2 March of this year, a number of urgent problems, which are connected with the progress of our present research in the South Pole region, were posed in a pointed manner. The remarks meant for the USSR Academy of Sciences concerning the relaxation of attention to basic research in the Antarctic are correct. In part this occurred because at one time the Soviet Antarctic Expedition (SAE) was partially transferred together with the manning table from the Academy of Sciences to the State Committee for Hydrometeorology and Environmental Control.

As of that moment the gradual process of the "exhaustion" of science in the Soviet Antarctic Expedition also began, since it is impossible by the efforts of departmental science alone to support a sufficiently broad front of research.

PRAVDA correctly stressed that the Antarctic is a unique natural region, which is of increased interest for science. Moreover, it turned out historically that this region became the site of the exertion of the efforts of the

international community of scientists. Here each country demonstrates its advanced scientific achievements, and any blunder or lag is visible to everyone.

Research in the South Pole region, of course, is a matter of state importance, and our country, guided by the provisions of the Antarctic Treaty, as well as by the obligations, which are connected with participation in the International Scientific Committee on Antarctic Research (SCAR), should continue active research in this region.

Realizing this, the Presidium of the USSR Academy of Sciences is taking the actions that depend on it in order to correct the formed situation. A decision on the increase of the role of academic science in the study of the Antarctic has been prepared. The Interdepartmental Commission for the Study of the Antarctic (MKIA), which operates under the Presidium of the USSR Academy of Sciences, has been commissioned to prepare proposals on the development of the academywide program "The Antarctic" for 1990-1995 and the subsequent future.

Of course, the concerted actions of all the departments, which are conducting research in the Antarctic, and first of all the USSR State Committee for Hydrometeorology, to which overall responsibility for the Antarctic Expedition has been assigned, will be required in order to change the overall situation which has formed in the Soviet Antarctic Expedition. Precisely the USSR State Committee for Hydrometeorology should take vigorous actions on the improvement of the ecological situation in the regions of the operations of our stations. The Academy of Sciences is prepared to give support with consultations, theoretical developments, and expert evaluations.

To the questions of basic scientific research in the Antarctic, to the formulation and coordination of scientific programs—to all this we intend to devote constant attention.

Financial Causes of S&T Lag Discussed

18140296 Moscow NTR: PROBLEMY I RESHENIYA
in Russian No 11 (98), 1989 p 4

[Article by B. Polukhin under the rubric "The Forum":
"A Patent for Backwardness. The Congress Is Over. The
Discussion Continues"; first two paragraphs are NTR:
PROBLEMY I RESHENIYA introduction]

[Text] In one of the surveys devoted to the USSR, TIME
magazine wrote: "If we deprive the Soviet Union of its
army and nuclear warheads, we will have before us a
developing country." Without a sense of false patriotism
it must be admitted that this estimation of the level of
our scientific and technical status from outside is close to
the truth. Not by chance were precisely the sectors of
machine building and electronics criticized most pointedly
at the Congress of People's Deputies.

What led us to a technical lag behind the leading western
countries? First of all the chronic rejection by production
of the innovation process or, in the language of experi-
enced workers, the introduction of major inventions and
the latest technologies. And contrary to the expectations
and predictions of many specialists, the changeover of
the national economic complex to cost accounting
merely increased its lack of receptivity to fundamental
innovations. The reason?

Running in Place

Specialists, who deal professionally with the problems of
introduction, explain it in different ways.

"The entire root of the trouble lies in the armchair
disease of the directors of enterprises, which has affected
their capacity for innovative risk," Candidate of Eco-
nomic Sciences G. Ivanenko, for example, said in a
conversation with this correspondent.

Other scientists blame the improper organization of the
introduction of the achievements of science in produc-
tion for everything. And as an example they cite the
process of assimilating new equipment in the United
States. There special large sectorial scientific and tech-
nical laboratories, design bureaus, and pilot plants deal
with this. They also assume all the innovative risk
connected with development. It remains for industrial
enterprises to set up only production itself.

The problem of introduction is so urgent today that no
discussion by specialists of the tasks of the restructuring
of the national economy passes over it. That is why I
went with great interest to the round-table meeting
organized by the Institute of Economics of the USSR
Academy of Sciences on the theme "Economic Reform
and the Acceleration of the Development of Machine
Building" (see NTR, No 8, 1989). But there were no
discussions on the identification of the causes of the
unsatisfactory assimilation of the achievements of sci-
entific and technical progress. The majority of scientists
and experienced workers, who had gathered in the con-
ference room of the institute, quickly came to a common

opinion, which Corresponding Member of the USSR
Academy of Sciences L. Gatovskiy then summarized: the
stagnation of innovation is explained by the lack of
market competition.

But what if one opens the "small chest" from the other
side? I understood that it is possible to do this, when I
made the acquaintance of A. Samokhvalov, director of
the Moscow Petroleum Refinery. To the question, why
had production workers, after changing over simulta-
neously to self-financing, not thrown open the gates of
enterprises for revolutionary equipment and technology,
he replied: "In order not to simultaneously go
bankrupt." And he cited a simple example. Let us
assume that the Moscow Petroleum Refinery at the
beginning of this year invested 1 million rubles in the
development of some latest technology. And suddenly a
miracle happened: the refinery not only introduced it
this year, but also derived a profit of 1 million rubles,
having recovered all the expenditures. Well done! How
should I put it?... The enterprise will get from these 1
million rubles, which were earned by it, only 223,800
rubles—in conformity with its share of the profit (22.38
percent).

Hence, the outlays on the innovation will be covered no
earlier than 1993, while with allowance made for the
increase of amortization and other deductions this date
will be postponed further. But since the 1 million rubles,
which were given to science, have dropped from the
turnover of the refinery for all these years, the collective
has an immediate loss.

But more often an idea, which has been tried by sci-
entists in a test tube, works poorly or not at all in practice.
Even at experienced western introducing firms, which
know, as they say, inside out how to choose from 1,000
proposed inventions and discoveries economically
promising ideas, only 20 percent of the projects financed
by them actually yield a profit.

Will the normal director of an enterprise in such an
economic situation risk investing large amounts of assets
from the pocket of the collective in innovations? It is
necessary to be Chekhov's Semi-Bulatov, for whom the
ruble did not have "any value, science obscured it...with
its longest wings." Such a production worker, of course,
is a find for a "neighbor" from a scientific research
institute.

And still directors take risks. But to what does this lead?
Thus, the collective of the Gomselmash Production
Association in 1 year developed and assimilated the
Polesye-250 general-purpose power-generating unit. It
spent, of course, much capital and was actually left
without a wage fund. And S. Drozd, general director of
the association, having camped after this on the doorstep
of banks, draws a sad conclusion: it costs oneself more to
develop competitive equipment....

Who Will Pay for Progress?

How is one to get out of this economically absurd situation? "It is impossible to answer this question without a search, without an experiment," Academician L. Abalkin said at one of the meetings of the Presidium of the USSR Academy of Sciences during the discussion of the state basic research program "The Improvement of the Mechanism of the Management of the Socialist Economy."

But in an experiment one cannot do without ideas, which show in what direction to conduct it. What ones are specialists proposing?

It is easy to understand the view of V. Kabaidze, when he says that if the maneuver of an enterprise is limited to only 31.5 percent of the profit, it is far more comfortable and advantageous not to take risks.

Or, as S. Drozd proposes, it is necessary to provide for the expenditures on the development of new equipment at some privileged standard enterprises and, perhaps, to establish in the ministry a reserve fund for the special-purpose financing of long-range development.

And how are they solving these problems of introduction in the West? U.S. venture companies, for example, in addition to their own capital, attract investments of large corporations and the state. The example of Trilogy Systems, which in the early 1980's undertook to develop a supermicrocircuit for a new generation of computers, is well known. It obtained from various sources a record amount—\$270 million of "risk" capital. And although the company was not able to meet its obligations, the very principle of the approach to innovation is important for us.

Is it also impossible for us to develop a similar mechanism of the formation of "risk" capital at an innovator enterprise? True, we do not have giant corporations that are interested in finding new highly profitable spheres of the application of capital.

"But what is preventing the sectorial ministry from performing the role of such a corporation?" A. Samokhvalov expressed his opinion. "Why should the ministry and the state not become shareholders of a plant in the financing of scientific development? That is, invest some (perhaps, a large) portion of the assets from the centralized fund not directly in science, but in science through an enterprise, which has expressed the wish and is willing to introduce a world-level invention at its own place.

It is possible to take as the basis of sharing the same percentages of the standardized distribution of the profit. For example, if we deduct 62.7 percent for the minister and 14.9 percent for the state budget and leave for ourselves 22.3 percent of the profit, their investment in a new development should also be divided in the same proportion.

And then, following the idea of the director, in case of success each participant will receive his share of the additional profit—in conformity with the investment. While in case of failure, having been split among all the participants in the financing, it will still hit the enterprise in the pocket not in the same way as if only it had to pay for the innovation. And the very probability of a "puncture" in this case is significantly less, since each party will be economically interested in the overall success.

When the threat of losing at once much money (for which the collective could, let us assume, build a brick shop or erect housing for workers) ceases to hang over a plant, the directors themselves will go to scientific research institutes for innovations. While the most farsighted ones will also finance exploratory research. Moreover, participation in the innovation risk would force ministries, as well as the State Committee for Science and Technology and the State Planning Committee to approach more responsibly and realistically the formulation of plans and programs of scientific and technical progress.

However, it is also impossible to ignore the fact that some specialists consider innovation simply incompatible with cost account. Thus, Corresponding Member P. Bunich stated his opinion frankly: "If you want to make a scientific and technical revolution at its highest spiral, the worst method for this is to convert business to cost account." Since only superpower associations like the VAZ [Volga Automotive Works] Association are capable of financing revolutionary technical progress.

The One on the Move Will Master the Road

Doctor of Economic Sciences A. Yeremin was even more categorical in his opinions. He believes that the farming out of the innovation process to production workers is one of the regular pseudo-experiments. Why?

Technical progress today has become such an expensive amusement that the enterprise, which introduces a fundamental innovation, will always lose. And neither the increase by the production collective of the share of deductions from the profit nor the occasional sponsorship of the ministry and the state will change fundamentally the economically unprofitable situation for the plant. For it is impossible to expect from an innovation, the prospects of which are based on the technical level, an immediate return, and at times in the immediate future the expenditures might also not be recovered. As was the case, for example, with NC machine tools, which only now are experiencing genuine economically efficient assimilation. Hence, production workers will continue to cling to "a sure thing"....

What does A. Yeremin suggest?

"Perhaps, my suggestion will seem today blasphemous to some, but I believe that it is necessary to withdraw the assets for scientific and technical development, which are formed at enterprises, for the centralized fund. And

to leave them only the sums that are necessary for current improvements. Moreover, their amount should not depend on the profit of the collective. It is possible to tie the standard, for example, to the value of the active portion of the fixed capital."

Many specialists, of course, will be opposed to such a statement of the question by the economist. They say, by this step we will clip the wings of the initiative and enterprise of production workers. However, one ought not forget that even in developed western countries nearly half of the expenditures on scientific and technical progress are financed from the state budget. True, there are also advocates of the absolute decentralization of the management of this process there. On which well-known English economist A. Nove observed: "The electric network is a unified whole, and the attempts of the government of Mrs. Thatcher to break this network into competing parts is an example of the ideological blindness found in our country!"

And are western directors that independent in their actions? American economist W. Leontief, while in the USSR, at meetings with our specialists related that a manager of a subdivision in corporations actually can decrease or increase the volume of output at his own discretion. However, if he wants to make capital investments which, say, exceed \$1 million, he should obtain permission for this from the management of the corporation and thoroughly substantiate his proposal.

But the idea of financing the scientific and technical development of production by means of enterprises' own revenues also did not originate from armchair speculations. Precisely in case of centralized management such scientific developments of ours as, for example, the continuous casting of steel promoted technical progress more in Japan than in Soviet metallurgy. However, let us note, it is a matter of Japan, a country which in the capitalist country is regarded as a model of scientific and technical progress on the governmental level. Precisely their successfully pursued scientific and technical policy is ensuring the great acceleration of technical progress. Hence, not centralization itself is in itself bad.

Thus, today there is the complete inability of enterprises to self-finance technical progress. This is pseudo-self-financing, as P. Bunich defined it while addressing the Congress of People's Deputies. But it is impossible to successfully solve scientific and technical problems without having first solved the economic problems.

It is clear that it is necessary to reject immediately the present faulty mechanism of financing. The problem is urgent: according to the figures cited in the report of N.I. Ryzhkov, 40 percent of the 1.9 trillion rubles of fixed production capital is worn out. But what mechanism is to be adopted in exchange? One of those proposed here is: to increase for enterprises the percentage of the deduction from the profit, to attract contributions of the ministry and the state budget, to completely centralize the innovation process—or are there other versions?

Incentives for Forming Self-Financing Units Discussed

18140305 Moscow *TEKHNIKA I NAUKA* in Russian No 5, May 89 pp 20-21

[Interview with Oleg Nikolayevich Devyatov, chief of production department of the board of the USSR NIO Union, by E.I. Sorokin: "Very Profitably!"; first paragraph is *TEKHNIKA I NAUKA* introduction]

[Text] The constituent congress of the All-Union Association of Scientific and Technical Cooperatives and Cost-Accounting Organizations of Enterprises was held in Moscow last December. O. N. Devyatov, chief of the production department of the USSR NIO Union board, tells our correspondent about the significance of this event.

TEKHNIKA I NAUKA: Oleg Nikolayevich, before starting our conversation on the recently created Association, I would like to acquaint you with a letter to the editors from S.A. Dupak, deputy chairmen of the Ukrainian republic board of the Power Engineering and Electrical Engineering Industry VNTU [All-Union Scientific and Technical Association]. He asked if it is possible to give bonuses to staff employees and the non-staff aktiv "for ensuring the creation and activity of temporary creative collectives?"

O. N. Devyatov: Last September, the presidium of the board of the NIO [Science-Engineering Society] Union passed a resolution which permitted the establishment of personal increases of up to 50 percent of the pay rate for staff employees of organizations in the NIO Union as a form of incentive for such work. The same resolution permits giving bonuses to a creative public aktiv, without limitation on the size of the bonus. The resources for this are taken from a special fund, formed according to a fixed standard out of the organizations' cost-accounting income.

TEKHNIKA I NAUKA: Not long ago, I was on a business trip in Tbilisi and spoke to N.N. Zubiashvili there, director of the Tbilisi House of Engineering. She frankly complained that she has no possibilities for encouraging the active work of their associates in creating and setting up the work of an VTK.

O. N. Devyatov: The incentive system that I just mentioned has been extended to the House of Engineering as well.

TEKHNIKA I NAUKA: What has already been done to develop cost-accounting forms of work, which are new for the USSR Union of Scientific and Engineering Societies [SNIO]?

O. N. Devyatov: A great deal, I would say. In a short period of time, more than 150 cost-accounting centers for scientific and technical services have been created. To solve specific scientific and technical problems, more than 10,000 temporary creative collectives (VTK) have been formed, in the work of which more than 65,000

specialists, engineers and scientists participate. Scientific and technical output amounting to more than 100 million rubles has been created. However, the main thing is something else. The engineering corps has received real possibilities to cooperate actively in scientific and technical progress. In this regard, the prestige of engineering labor is increasing.

TEKHNIKA I NAUKA: So, it turns out that an effective network of cost-accounting collectives—temporary or permanent—has been formed in the SNIO. Then a question suggests itself: why is yet another structure, in the form of the newly-created Association of Cost-Accounting Organizations, needed? Aren't superstructures being produced?

O. N. Devyatov: A good question. In answering it, I should emphasize, above all, that the principles of restructuring provide an opportunity to radically change production relations, without changing forms of ownership. Now, to the point. First, the Association was not created "from above." It appeared as a result of the voluntary unification of the scientific and technical cooperatives and cost-accounting centers of public organizations. The interrelations between Association members and its executive leadership are structured on the basis of the complete freedom of the Association members (the creators of production). They maintain the executive apparatus of administration only in order to fulfill the functions assigned to it by the statutes. The Council of Directors periodically evaluates the executive body's work.

Essentially, this system can be considered a model for future interrelations in the country's national economic sectors. Is this unusual? Maybe, but it is not a fantasy at all!

Now the second point: in the USSR SNIO system we really have created a small, for the time being, but entirely capable cost-accounting scientific production sector which supplements the state system, and in this regard somewhat undermines the monopoly of several state institutions. The effectiveness of this sector's work will increase significantly, if conditions are created for forming free ties, coordinated by the Association and protected by it from the diktat of departments, within the framework of the entire national economy. Therefore the USSR SNIO acted as the sponsor and initiator for the creation of such an organization, refusing any control whatsoever over its activity.

TEKHNIKA I NAUKA: Understandable. Yet, I would now like to approach the subject from the other end. The staff employees of the USSR SNIO and the non-staff aktiv will be materially encouraged for developing cost-accounting forms of work. How does the Union on the whole benefit from the appearance of the association? And what can the USSR SNIO give it?

O. N. Devyatov: Let me answer the second part of the question first. The union has extensive possibilities of attracting highly skilled specialists from different fields

of science and engineering. After all, it unites 29 all-union scientific and technical societies and can serve as an active intermediary in setting up interbranch creative ties. The union also plays a useful role in establishing and developing ties among association members and the scientific and engineering and technical community and companies of foreign countries. These ties of ours are sufficiently broad and well-arranged, there is enough complete information needed for foreign economic activity, and much else.

As far as the first part of your question is concerned, scientific and technical progress in our country benefits from this above all, and seeing to its acceleration is our union's most important task.

TEKHNIKA I NAUKA: You talked about the association's different directions and activities. What others, besides those mentioned, do you have in mind here?

O. N. Devyatov: It would probably take a long time to enumerate all the problems that the association is called on to solve, so I will name the basic ones: studying and generalizing advanced experience in administration and economic management; preparing proposals to improve legislation which directly concerns the activity of association members; the creation of collective forms of service by developing intermediate information, supply, polygraphic, marketing, legal, advertising, and other organizations on a cost-accounting and cooperative basis; offering consultation and other types of assistance to association members; discovering sources of financing and providing resources for scientific and technical development work, and bringing this information to potential executors among the association members; collaboration of association members in solving large scientific and technical problems based on the principles of a program-oriented approach. As you see, the directions of activity are rather broad and diverse.

TEKHNIKA I NAUKA: You listed the creation of collective forms of services. How will this be implemented?

O. N. Devyatov: For example, a collective information bank will be created for ideas, problems, ready-made developments, and highly skilled specialists. There is an agreement with the board of directors of the VDNKh [All-Union Exposition of the Achievements of the National Economy] to create a permanent collective exhibition and sale of scientific and technical production. An international market will be held once every one or two years.

TEKHNIKA I NAUKA: You mentioned consultation and other types of assistance for association members. What other kinds of assistance could there be?

O. N. Devyatov: Well, for example, the protection of intellectual property. After all, everyone knows that the author of a scientific or technical idea, even if he has an

author's certificate, is often without rights and defenseless in the face of the departmental bureaucratic machine.

The association is also called upon to ensure the protection of its members' interests by way of the bodies of soviet power, having nominated candidate deputies to the soviets at all levels from among its ranks. Another kind of assistance is the centralized acceptance of a state order and its distribution among the members on a competitive basis.

TEKHNIKA I NAUKA: You said that cooperative and cost-accounting organizations and enterprises can join the association. What does "cost-accounting enterprise" mean? After all, as of 1 January, all industrial enterprises became cost-accounting. Are they really all invited into the association?

O. N. Devyatov: Why not? This was stipulated in the association's statutes. If a labor collective of a particular state enterprise believes it useful to join the association, the doors are open for it. I am personally convinced that the benefit will be mutual. The presence of large enterprises substantially expands the possibilities of the association and will provide the necessary production base for the mass application of the achievements being created in the cooperative and cost-accounting centers of the USSR SNIO, the VOIR and the NTTM. Furthermore, today I see no better partner for a state enterprise in the struggle against bureaucracy and departmental diktat, than a powerful public organization, such as this formation was conceived.

TEKHNIKA I NAUKA: The idea of combining a small scientific and technical cooperative which might consist, for example, of three engineers, with an enormous company like "Energomash," "Tekhnokhim," or the Eye Microsurgery MNTTs in one association seems somewhat strange.

O. N. Devyatov: It only seems so at first glance. In fact, there is nothing unnatural about such a combination. Look at how this is done in nature, in life. Incidentally, the experience of leading foreign (particularly Japanese) companies attests to the rationality and mutual profitability of such collaboration. Small companies are free of the shortcomings inherent in large enterprises: they are more flexible and react more rapidly to market fluctuations. Often, it is precisely they who generate new engineering ideas. Yet large companies have advantages of their own. Balanced production relations between them, based on using the advantages of both forms and the mutual elimination of weak parts, brings striking results. Small companies which drop out of the overall progressive rhythm of society's development are dying off, and promising companies are generously subsidized by the "big guys." And work goes on. I have no doubt that it will work here as well.

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Chairman of Innovation Bank Interviewed
*18140304 Moscow IZOBRETATEL I
RATSIONALIZATOR in Russian
No 6, Jun 89 pp 10, 15*

[Interview with V. V. Vinogradov, chairman of the board of the Moscow Innovation Commercial Bank, by the editor in chief of IZOBRETATEL I RATSIONALIZATOR, under the rubric "Financial Affairs": "They Invite, While Warning"; date and place not given; first paragraph is IZOBRETATEL I RATSIONALIZATOR introduction]

[Text] V. V. Vinogradov, chairman of the board of the Moscow Innovation Commercial Bank, granted an interview to the editor in chief of IZOBRETATEL I RATSIONALIZATOR.

[Boxed item: The Moscow Innovation Commercial Bank, Inkombank-Interznaniye, organizes the introduction of new technical solutions.

[The bank is seeking new shareholders in the person of enterprises, organizations, cooperatives, associations, scientific research institutes, and design bureaus—on quite advantageous terms: a profit of at least 4 percent per annum of the amount of the subscription.

[Address: 11562, Moscow, Kashirskoye Highway, Building 57, Block 5. The Moscow Innovation Commercial Bank.]

IZOBRETATEL I RATSIONALIZATOR: The Charter of your bank was adopted in October, while it was registered in the USSR State Bank in November. Is it probably more appropriate for the present to talk not so much about the results as about the tasks?

V. V. Vinogradov: For the bank 2-3 months are a considerable period, so that results also exist. While six tasks are listed in our Charter, and the first of them is to contribute to the acceleration of scientific and technical progress.

IZOBRETATEL I RATSIONALIZATOR: How?

V. V. Vinogradov: We finance developers of new equipment, both collective and individual. We deal with the analysis of supply and demand, seek enterprises and organizations, which could introduce the given innovation.... Powerful organizing potentials, good material and technical supply...are needed for the assimilation of a more or less serious innovative development. You will not do anything with money alone. Money is only a part of introduction. Many people have a naive idea of a bank—they say, a bank issues money and waits for when they will return it to it with interest. But we are now actively establishing enterprises of the bank, joint ventures of the bank and some plant, factory, or association. These joint ventures will produce a new product on the basis of a new technical idea. And our main profit will come from the sale of this product, that is, from the introduction of inventions and various designs. The

interest is a support, a trifle. While the profit from the sale of a new technical solution is the base, the root of commercial success lies in this. We are an innovation, introduction bank!

IZOBRETATEL I RATSIONALIZATOR: What is the procedure of financing inventions? To whom do you transfer the money?

V. V. Vinogradov: We conclude a contract on introduction with enterprises, cooperatives, centers of the scientific and technical creativity of youth, and so on. And we transfer the money to them. And, as I just said, to enterprises of the bank.

IZOBRETATEL I RATSIONALIZATOR: If it is no secret, are the assets of the bank now large?

V. V. Vinogradov: It is no secret. We now have 9 million rubles of our own and about 15 million rubles of attracted assets.

IZOBRETATEL I RATSIONALIZATOR: Who has become a shareholder of the bank?

V. V. Vinogradov: First of all the Society for Knowledge, then the Moscow City Soviet Executive Committee, the Rotor Scientific Production Association, which is from Cherkassy, the Moscow Institute of the National Economy imeni G.V. Plekhanov, and the Credit and Finance Scientific Research Institute of USSR Banks attached to the USSR State Bank, we also found shareholders in Dnepropetrovsk, Norilsk, Kaliningrad....

IZOBRETATEL I RATSIONALIZATOR: Is it possible to cite figures, the amounts of the shares?

V. V. Vinogradov: Well, in foreign practice it is not customary to name them, but here in the Soviet Union, in general, they now publish everything, and, it seems, there has been no trouble because of this. Here, they are as follows: the Society for Knowledge—3 million rubles, the Moscow City Soviet Executive Committee—1.5 million rubles, the rest gave less—400,000, 200,000, and 50,000 rubles.... Even private traders came and offered their money.

IZOBRETATEL I RATSIONALIZATOR: Is that so?

V. V. Vinogradov: Yes, several people came. We offered to take from them 50,000, 100,000 rubles, one person even gave 200,000 rubles.... They had heard that we guarantee 4 percent per annum, and this is the minimum. But we do not accept subscriptions to the authorized capital stock from private individuals.

IZOBRETATEL I RATSIONALIZATOR: But why should money from private individuals not work for invention? There is nothing surprising in the fact that well-known writers, artists, sculptors...have, for example, hundreds of thousands and, perhaps, millions of rubles. Why, if they would like to invest money in your bank, prohibit them from doing this?

V. V. Vinogradov: We are not the ones who decide.

IZOBRETATEL I RATSIONALIZATOR: When will you decide?.... Incidentally, good luck to them, the Soviet millionaires. You said that you guarantee your depositors 4 percent per annum. While the Leningrad innovation bank, IZOBRETATEL I RATSIONALIZATOR wrote about this, is hoping for 8-10 percent.

V. V. Vinogradov: Hopes are not a guarantee. We, perhaps, hope for 20 percent, but do not talk about this....

IZOBRETATEL I RATSIONALIZATOR: So, are 9 million rubles sufficient for you?

V. V. Vinogradov: The 9 million rubles are altogether not much. We are capable of investing about 50-60 million rubles in new technologies in a year. There are tempting suggestions to finance promising developments. We have already granted the bulk of our assets to borrowers and are willing to support new ideas. But there is still not quite enough money. We need shareholders. We pay the first profit 6 months after the receipt of the deposit.

IZOBRETATEL I RATSIONALIZATOR: Innovation banks are a new thing for our economy. How is the Ministry of Finance treating you?

V. V. Vinogradov: The stand of the Ministry of Finance greatly disturbs us. A tax rate on the profit of more than 60 percent is suggested! The figure is unimaginable. It seems to me that the comrade executives of the department have gotten heated up. In foreign practice new banks for the first 2 years are not taxed at all, while innovation funds are not taxed at all, even beyond the first 2 years. We have not gotten accustomed to tax-free practice, but not 60 percent!...

IZOBRETATEL I RATSIONALIZATOR: How do you select ideas for introduction?

V. V. Vinogradov: At first we thought that it was enough to make an appeal—to inventors, enterprises, cooperatives—and inventions would converge on us, we would make an examination, study the market.... That is how they work abroad. But in our country enterprises do not very willingly agree to introduction. Although there have also appeared such ones which want to forge ahead by means of new equipment. Now, let us assume, 10 technical solutions on some problem have been sent to us. We select from these 10, perhaps, not even the economically most advantageous one, not the technically most original one, but the one that meets the requirements of enterprises and their production potentials. If the proposed invention is not in demand, we will not take it. For the most part the standard of production—the world standard—does not exist at our Soviet enterprises. Therefore, we are forced to select only the innovations that are within the capability of our average enterprise.

IZOBRETATEL I RATSIONALIZATOR: What developments has the bank already financed?

V. V. Vinogradov: There are quite a few developments: a wave technology of the intensification of production processes, rotary conveyor lines for the production of plastic consumer goods, the production from scrap wood of fireplace fuel briquettes for export, an electric pulse technology of the recovery of scrap concrete.... A technology of the destruction and processing of old paper money and secret documents, a rotary conveyor molding machine for the production of thermal insulation slabs..... Is that enough, or should I name more?

IZOBRETATEL I RATSIONALIZATOR: Go ahead. From this list the reader of IZOBRETATEL I RATSIONALIZATOR will determine best of all with what he should turn to you.

V. V. Vinogradov: A biotechnology of preserving fruits and vegetables in an inert atmosphere, the processing of food scraps and garbage, the cleaning of pipelines of any diameter with a turning angle of up to 90 degrees, the casting of garden sheds made of ash and slags, the conversion of waste paper and paper scrap into cardboard, a system for the estimation of the harm from sewage contamination, the vibration hardening of welded joints....

IZOBRETATEL I RATSIONALIZATOR: What themes would the bank now take most willingly from inventors?

V. V. Vinogradov: The range of our interests, as you see, is large, and we will consider all proposals, but resource conservation now interests us most of all. And especially technology which is connected with the construction industry: the saving of cement and metal at construction sites.... Because in this sphere we already have rather good ties. And here is another thing: You publish this interview, and 100 inventors will come to us....

IZOBRETATEL I RATSIONALIZATOR: Perhaps, even more.

V. V. Vinogradov: I want to warn that we prefer those authors who already have prototypes.

IZOBRETATEL I RATSIONALIZATOR: But often the author simply does not have the slightest opportunity to produce a prototype. For example, a new type of engine is proposed....

V. V. Vinogradov: All the same there should be a technical and economic substantiation. We do not need

"bare" inventor's certificates. This is a piece of paper, the economic essence of the invention is not visible behind it. It is precisely not mandatory for us that there be an invention, we will consider any idea that is promising for the market. We can even, if we consider it necessary, go to the site and examine and check everything. We have approximate demands on the technical and economic substantiations of proposed designs, will there be space for them in IZOBRETATEL I RATSIONALIZATOR?

IZOBRETATEL I RATSIONALIZATOR: Let us return to this at the end of the interview. But now about the reward to the innovator. How does the bank settle accounts with the author of an accepted idea?

V. V. Vinogradov: By contract. The initial amount is comparatively small—from 100 to 500 rubles. This, so to speak, is the payment for the idea, the redemption fee of the document, a guarantee that the bank has undertaken introduction. The basic remuneration is not from the idea, but from its realization, from the sale of the finished product. We propose to pay for 5 years—a specific percentage of the profit.

IZOBRETATEL I RATSIONALIZATOR: So what are your demands on proposed ideas?

V. V. Vinogradov: The technical and economic substantiation should contain the surname, name, and patronymic of the developer, his address and telephone number, and the name of the development. Then there are seven items. 1) A schematic diagram and the technical essence of the proposal, the area of application—all this is in brief, without excess words. 2) The basic distinctions of what is being proposed, which ensure a positive impact—economic or social. 3) The patent purity: the availability of an inventor's certificate, open or secret, the possibility of patenting abroad, the availability of know-how. 4) The degree of readiness of the idea for industrial use: a laboratory model, a conceptual design, working documents, a production prototype, the need for the enlistment of specialists, the availability of a manufacturing enterprise.... 5) The amount of anticipated expenditures, preferably by years—the 1st, 2d, 3d, 4th, and 5th years. 6) The amount of the anticipated economic impact, also by years. 7) The anticipated capacity of the market—domestic and foreign. I understand that it is not easy to calculate all this, but meticulous calculations are also not necessary—the bank needs only rough guidelines.

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Problems With Material, Technical Supply of MNTK's

18140281 Moscow IZVESTIYA in Russian
3 Jul 89 Morning Edition p 3

[Article by F. Kontorovich, head of the sector of the improvement of the supply of science of the Leningrad Department of the Scientific Research Institute of Economics and Organization of Material and Technical Supply attached to the USSR State Committee for Material and Technical Supply, Candidate of Technical Sciences O. Pavlova, and Candidate of Economic Sciences T. Raskova: "With an Outstretched Hand. What Is Hindering the Acceleration of Scientific and Technical Progress"]

[Text] When the government established interbranch scientific technical complexes [MNTK's], it expected that they would help to accomplish revolutionary breakthroughs in engineering and technology. However, soon the complexes had already become a form, which drew in the contradictions and shortcomings that are inherent in the conventional mechanism of the interaction of enterprises and organizations, which belong to different departments. The majority of scientific and technical organizations are supplied with resources in accordance with the remainder principle. The supply and marketing subdivisions of the USSR State Committee for Material and Technical Supply as before are adhering to the old arrangement: the consumer should himself determine in advance what he needs, without going beyond the "base" need.

The intermediary is not at all interested in the forecasting of demand and the trends of the change of market conditions, inasmuch as a real market of means of production has not yet formed. Due to this the feedback of supply and marketing institutions with industry and the consumers of its products is exceptionally weak and passive. It cannot be otherwise, since the level of resources for wholesale trade is established from above and is restricted either by the range of items or by limits. The "discrepancy" between supply and demand is so great that, according to our data, more than half of some types of resources for research and development have to be obtained in a roundabout way, through unofficial channels.

Does an alternative exist, it is possible to change radically the situation in the material and technical supply of interbranch scientific technical complexes? It is possible, provided such a task is regarded as a part of the overall problem of improving the supply of science.

It is legitimate to pose the question: Is it practicable in the immediate future to put an end to the remainder principle in the meeting of the needs of science? If we speak about series-produced output for production engineering purposes, it is entirely practicable. What is required for this? In our opinion, the assistance of a regional intermediary is needed. Let us arbitrarily call it "the interbranch commercial association for the supply of science" or in short the Nauchsnaborg MKO [Interbranch Commercial Association]. Such an association could be a state or state cooperative association, an association of stockholders, or a consortium of consumers. Its main task is to supply regional science with the needed products at the needed time and in the necessary quantity. This intermediary would take upon itself both planning and forecasting estimates of the consumption of resources. Of course, the broader the group of its clients is, the more effective the return of their aggregate reserves of material resources is.

The long-standing struggle against limits (funds) deformed the psychology of managers. Under the conditions of a shortage the idea of the cooperation of "their own" resources with those of "others" may seem suicidal to them. But this apprehension was justified yesterday, when the reserve did not squeeze the pocket. Tomorrow the low turnover rate of resources will strike a painful blow to the working capital of organizations. And it will be to one's disadvantage to keep surpluses of instruments and equipment. In order to completely ensure the fulfillment of research and development with the least inefficient costs and with the minimum economic risk, it is necessary to establish a branched system of territorial complexes for the service of science and technology.

An infrastructure of this sort is an integral multifunctional organism, which includes the rental of instruments, centers for the collective use of expensive equipment for scientific research, test stands, interbranch pilot experimental works, scientific production cooperatives like venture firms, an information network with data banks—in short, everything that speeds up research and development and their introduction and ensures the effective increase of science-intensive output.

By joining on a voluntary basis a regional consumer association, scientific and technical organizations will be able to rise to a new level of their development. Of course, this is possible only in case of the effective support of the government, the USSR State Committee for Material and Technical Supply, the State Committee for Science and Technology, and the sectors.

Scholarship Fund for Promising Young Scientists Established

18140307 Moscow *TEKHNIKA I NAUKA* in Russian
No 5, May 89 p 8

[Article by Candidate of Economic Sciences I. N. Kovalevskaya, first deputy chairman of the Council of Founders of the Intellect All-Union Philanthropic Foundation: "The Intellect All-Union Philanthropic Foundation"; first paragraph is *TEKHNIKA I NAUKA* introduction]

[Text] The foundation was established on the initiative of the All-Union Association of Scientific and Technical Cooperatives and Cost Accounting Enterprises and Organizations attached to the USSR Union of Scientific and Engineering Societies.

It is called philanthropic not by chance. In recent times the sacred words "philanthropy," "charity," and "patronage," which seemed to have been forgotten, have acquired the former reverential sound and the Russian warmth from time immemorial. Without this today one will not revive the scientific and technical intelligentsia of the country. State organs are simply incapable of taking upon themselves all the necessary material and intellectual expenditures, which are connected with the accomplishment of such a large-scale task. Therefore, we will be able to accomplish what has been contemplated only on the basis of voluntary donations—both collective and individual—and with the support of trustee organizations.

The basic activity of the foundation is the search for gifted children and the creation of the necessary conditions for the detection and extension of their natural abilities. At specialized schools we want to revive the traditions of the old Russian lyceums, where instruction in the natural sciences was combined with a splendid

humanities education and harmonious esthetic training. We intend to establish international schools, where from the earliest age children from different countries would learn not only to speak different languages, but also to find a common language.

Anticipating possible reproaches, I will stress: yes, the program task of the Intellect Foundation is to create an elite. But, in contrast to the now existing elite, it will be formed exclusively on the basis of giftedness. And whereas the present "cream" of society, which has dominated the sphere of distribution, at times is fruitless, the intellectual elite is one of the decisive conditions of progress and any investment in it will be returned to society multiplied by many fold.

Everyone, who shares our concern about the future of the homeland, can already today participate in the programs and actions of our foundation. If you are willing to participate in the search for talented children, the organization of educational methods centers, and the establishment of schools, circles, clubs, and recreation sites, we ask you to report this to the address: 119034, Moscow, Kursovoy pereulok, 17, the USSR Union of Scientific and Engineering Societies, the Intellect All-Union Philanthropic Foundation.

We thank in advance the collectives and individuals, who consider it possible to transfer their donations to our current account No 2700207 at the address: 119146, Moscow, Komsomolskiy prospekt, 35, the Leninskiy Branch of the ZhSB, the Moscow Financial Department 201188, and to report the transfer to us at the telephone numbers: 235-06-61 or 268-16-40.

Participation in the Intellect Foundation is not simply philanthropy, it is a contribution to the future of the homeland and our children and grandchildren.

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Problems of Software Piracy, Programming Industry**Piracy Issues Outlined**

18140283 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 13 Jul 89 p 2

[Article by SOTSIALISTICHESKAYA INDUSTRIYA special correspondent S. Panasenko (Pereslavl-Zalesskiy): "Ethics of the Computer Age"]

[Text] Depending on the class of computer from 50 to 99 percent of the software, which is used in the country, was obtained illegally. This is either unconcealed theft or rewriting or, at best, compilation, the more or less extensive borrowing of prepared foreign solutions. Of course, this is happening without the knowledge and consent of the authors and without the least monetary compensation.

The situation with software for personal computers is most typical. Here the share of original domestic solutions falls to a nearly imperceptible quantity. Absolutely everything is shamelessly "fought over." Individuals are making a living out of the duplication of computer games. Cooperatives are trading in packages of other people's programs. The state is showing an example. It is acting in a big way, supplying all series-production personal computers with the built-in MS-DOS operating system, for the right of use of which no one ever paid its developer—the Microsoft Corporation—a cent. We are not giving any secret away here. At the Moscow Technology-89 Exhibition the people from Minsk with inconceivable pride demonstrated a computer of the YeS series with a built-in Russian version of this operating system. Specialists from Microsoft easily recognized their child and with an innocent air asked...that this miracle computer be sold to them. And they nearly shook hands on it with the manufacturers of the machine, who were exhilarated by the vision of the impending shower of dollars! It is only possible to guess with what kind of scandal this amazing export deal would have concluded.

Incidentally, a contradiction is hidden in the words "obtained illegally." "Illegally" is if there is a law that is being violated. But when there is no law, there is also nothing illegal. In contrast to the legislation of developed countries of the West the civil codes of the union republics do not envisage software among the objects of the copyright. Within the USSR it, regardless of its origin, belongs equally to everyone and no one, and no restrictions on use, copying, alteration, and corruption exist.

The economic and moral harm from this legal regime can be seen with the naked eye. The accessibility and inexpensiveness of software (its cost actually reduces to the cost of copying) are preventing the development of the software market. This, in turn, depreciates the labor of the programmer and undermines the economic foundation of computerization. The "dumping sin," in which

our software industry lives, when software wanders from computer to computer, is conducive to the multiplication of errors and computer virus epidemics.

For the sake of fairness let us note that software "piracy" has also not been eradicated in countries with long-standing and refined legal traditions. The profits are too great and the technique of theft is too simple and understandable. According to the data of the journal TECHNOLOGY REVIEW, in 1986 in the United States software makers failed to receive approximately \$1 billion due to the unsanctioned copying of their product. Lotus alone annually loses on this about \$160 million.

Until recently western firms turned a blind eye to our escapades. First, our use of software was scanty. Second, the autarkic, backward Soviet economy was not regarded in earnest as a software sales market. But the times are changing. We have declared the aspiration to become a part of the world economic community. We are bringing forth plans of the computerization of the country. The recent contract with the Siemens company for the delivery of 300,000 computers like the IBM PC XT shows that we have made up our mind very resolutely. In this situation our western partners are begin to demand quite justifiably that we bring our legal norms in line with the universally accepted norms. The problem, however, lies not only in the noncoincidence of several principles of our and the foreign copyright.

A law is not omnipotent. Customs, traditions, and unwritten moral and ethical codes crushed under themselves both the codes of Hammurabi and the Napoleonic code and will crush any future laws, if they differ from the rules of the community. Only the law, which coincides with the ethics and morals accepted in society, will be carried out. Otherwise they will conceal the murderer, vindicate the thief, and confirm the sincerity of the liar.

That is why the point of view that it is possible to put an end to "piracy" in the computer field only by the universal voluntary observance of the moral precepts which lead legislation, is gaining strength among programmers, scientists, and everyone who deals directly with the production and use of software. In the countries, where the necessary laws already exist, these voluntary moral obligations will aid the observance of legal norms. Where, as in the USSR, a legal mechanism for the present is lacking, they will replace it if only in part.

A new step in this direction was taken at the international forum that gathered on 29 and 30 June in the ancient Russian city of Pereslavl-Zalesskiy. The organizers—the Institute of Program Systems of the USSR Academy of Sciences, the Ashton-Tate Corporation, which produces software, and the weekly PIOSK—posed the task: to give Soviet and western specialists in the field of software the opportunity to formulate a common approach, a common stand in the combating of the illegal copying and use of software. The result of the

meeting is the declaration "The Principles of the Development of the Programming Industry on the Basis of the Legal Protection of Intellectual Ownership," which was adopted in Pereslavl.

The Pereslavl Declaration is a document that is open to any organizations and individuals for adherence. The original text of it has been turned over for safekeeping to the USSR Academy of Sciences, on behalf of which Chief Scientific Secretary of the Presidium of the USSR Academy of Sciences I. Makarov signed the document.

The voluntary abandonment of the pocketing of what lies in the way of temptation will evoke in some people surprise and even a sarcastic laugh. For, it would seem, it is clear to a child that it is far more advantageous to make off with something without paying than to buy it, especially when money is tight. But the whole point is that the entire world has come to the conclusion: it is economically more advantageous to behave respectably than to violate the norms of morality. And when a handful of Soviet programmers from the Pereslavl forum appeal to their countrymen to obey the norms of civilized society, they are doing this not because they have had a revelation. They simply see already the economic abyss, on the edge of which we have stopped in unstable equilibrium.

For 70 years we dealt with building an economy that would be completely independent of the surrounding world. We were exactly half successful: the surrounding world learned to manage peacefully without us. The second part of the task was not accomplished. Fate played a mean trick on us: the harder we strove for isolation, the stronger our technological and scientific dependence on western countries became. We bought plants and bought designs, but when we did not succeed in buying them, we resorted to other means. This dependence is particularly great in the area of what are called "high technologies": information science, biotechnology, membranes, and fine chemistry. And, of course, microprocessor and computer technology.

We got into trouble. A person, who wants to be admitted to respectable society, should rid himself of the habit of slipping silver spoons into his pocket. The choice is simple. Either you accept the suggested rules of behavior and they seat you at the common table or you do not, and what cannot be cured must be endured. But then one must reckon with the likelihood that, as Ostap Bender said to Balaganov, "your red curls will become familiar, and they will simply begin to strike you." And they may begin to strike us a very painful blow.

We cannot but adopt laws against computer "piracy," because without them henceforth no western software firm will deal with us, while without western software all our computerization and informatization will be an empty phrase. But we, to our horror, also cannot both borrow and adopt such a law. Because as soon as we adopt it, the same Microsoft through the closest people's

court will impose on us such fines that it will be cheaper to blow up the plants and to throw the products under a bulldozer.

The voluntary agreement of all the participants in the process to adhere to the rules, which are set forth in the Pereslavl Declaration, will be the only acceptable solution both for us and for our western partners. Thus there will be found a mutually acceptable resolution of the impasse—not the first one and, probably, not the last one in the way of our return to the common home of mankind.

From the editorial board. Taking into account the extraordinary importance of the question, the editorial board of the newspaper SOTSIALISTICHESKAYA INDUSTRIYA decided to publish an abridgment of the Pereslavl Declaration and is binding itself to observe the principles sent forth in it.

Declaration on Legal Protection

18140283 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 13 Jul 89 p 2

[Abridged text of Declaration "The Principles of the Development of the Programming Industry on the Basis of the Legal Protection of Intellectual Ownership"; passages in boldface as published]

[Text] 1. To Meet the Needs of the Economy

The normal and efficient development of the programming industry should be based on the interconnection of the interests and needs of both the users and the authors and suppliers of software. However, the programming industry can develop only when effective—in both the legal and the ethical respects—means of protection against unsanctioned copying exist.

The developing programming industry should oppose monopolism and unscrupulous competition, creating the conditions, under which the rights of individuals and small firms are protected. The authors of programs should be protected in exactly the same way against unscrupulous competition on the part of those who copy their programs without fair compensation.

2. The Need for the Protection of the Rights to Intellectual Ownership

The concept of the intellectual ownership of programs, which signifies the necessity of sanction of the owner to the copying or use of a program, plays a key role in the formation of the software market.

Both practical experience and theoretical research establish with certainty that the low quality of programs, the lack of provision of users with adequate services, the lack of strong enterprises that are suppliers of programs, and the low motivation for creative activity in this sphere are a consequence of unsanctioned copying. Unsanctioned copying can lead to infection with computer viruses.

Unsanctioned copying hinders the formation of the programming industry, already depriving users of many advantages on the domestic market.

The conditions for the development of the programming industry appear only if the protection of the intellectual ownership of software is ensured.

3. The Need for Strict Ethics and New Laws

The spread of new ethical and legal norms is the most important condition for the extensive use of the concept of intellectual ownership. In spite of the tradition of using copyrights and patent legislation, the present basic significance of the concept of intellectual ownership is a consequence of the transition to information society. Here in connection with the difficulties of detecting the fact of the unsanctioned copying of programs the voluntary observance of the moral norms, which have been adopted in society, proves to be the key factor of the development of the programming industry.

The following of morals should also be economically attractive, particularly due to the possibility of economic steps against violators of the norms.

A change of morals will initiate changes in national legislation and at the same time will serve as a guarantee of the observance of the corresponding legislation in practice. The corresponding changes in legislation contribute in exactly the same way to the evolution of ethical norms.

The extensive discussion of specific controversial cases and judicial practice may have a special place in the formation of new morals which are based on the respect of the principle of intellectual ownership.

4. Professional Morals and Legislation in the World Community

Professional ethics can and should be more international than the legal norms that regulate the issues of the protection of intellectual ownership. Thus, in conformity with the Universal Copyright Convention (Article 2) and other international documents the principle of "national regime" is used, that is, foreign authors have the same rights as national authors. Hence it follows that if in some country the rights of national authors of programs are not protected, as is actually happening, for example, in the USSR, foreign firms also have no legal grounds for claims.

But the moral norms, which have been adopted by the entire world community, regardless of legislation will condemn unsanctioned copying.

5. Education in Matters of Intellectual Ownership: Information on Rules and Standard Documents

Inasmuch as the concept of intellectual ownership is quite new, the inadequate knowledge about these issues of the broad groups of the population, who work with computers, is a serious obstacle to its use. The utmost

spreading of information about the rules, norms, traditions, precedents, laws, and so on, which have been adopted and are used by the world community, should be the goal of the entire community of programmers, regardless of nationality. An end should be put to illiteracy in the sphere of intellectual ownership. It is necessary to encourage the broadest exchange of information in these matters and to maintain contacts between the people and organizations of different countries.

6. The Infrastructure of the Market

The formation of the appropriate infrastructure is a necessary condition for the development of the software market. The task of the programming industry is first of all to look after the user and to make available to him not only his own copy of the program, but also a wide range of additional services: instruction, support, adaptation, and so on.

A developed infrastructure, in addition, is also a factor which checks unsanctioned copying, since the user is interested in obtaining additional services.

7. The Consideration of the Intentions of the Authors of Programs

A developed software market presumes a range of types of economic relations. The owner of the rights to a program can himself choose the method of its dissemination: without payment, payment as one wishes after trial use, and commercial channels.

But the boundaries between these types should be clear and well known within the ethical and legal norms. The author should himself indicate his intentions in obvious form, for example, in the license or in the opening screen to the program.

8. A Call to Actions

The programming industry is international: borders are not a serious obstacle to the dissemination of information products, particularly programs.

But the use of common legal and moral norms is necessary for normal international trade. First of all this pertains to the protection of intellectual ownership.

We address to governments, executives of sectors, businessmen, researchers, and all users and developers of programs the appeal to take practical steps in the development, dissemination, and use of the corresponding norms. The recognition of the use of programs without the permission of the owner of the rights to this program as illegitimate and morally unjustified will be the first and basic step in the implementation of these norms. The use of only conscientiously acquired software should be legal and moral. In case of the realization of this condition the programming industry will get a strong stimulus for development and progress in it will speed up.

9. Proposals for Governmental Institutions and Industry

Governments should promote in every possible way the creation of adequate conditions for the development of the software market and the programming industry. Governmental institutions can set a good example, if the staff members of these institutions use only the programs that have been acquired in a conscientious manner.

Like any truly good solution, the use of only legally acquired programs entails a large number of other positive consequences, which signify advantages not only for the sector as a whole, but also for all the people employed in it:

- the decrease of the need for state subsidies for the development of the sector (self-financing);
- the increase of product quality;
- the assurance of high-quality support;
- the formation of a developed infrastructure of the sector;
- the decrease of the danger of infection with computer viruses.

Any theories or principles should be embodied in practical deeds. The most visible realization of the principle of the protection of the intellectual ownership of software is the use of only conscientiously acquired programs.

Production Basis for Programming Support Needed

18140297 Moscow NTR: PROBLEMY I RESHENIYA in Russian No 12 (99), 1989 p 7

[Interview with V. Makarevich, member of the Collegium of the USSR State Committee for Computer Technology and Information Science, by NTR: PROBLEMY I RESHENIYA correspondent Ye. Fedorovskiy under the rubric "The Forum": "The Software Development Industry"; date and place not given; first four paragraphs are NTR: PROBLEMY I RESHENIYA introduction]

[Text] During the days of the Congress of People's Deputies, at which words condemning departmental methods of managing the economy were heard, cyberneticist-programmers gathered at their own congress—the first congress of the member organizations of the state computer technology and information science software system. A new practical approach to the solution of a key problem of management was implemented in one of the most important sectors of the national economy.

The experience of industrially developed countries shows: cybernetization is capable of imparting a powerful accelerating stimulus to the entire national economy. But, we admit, we sure needed computers during the times of the administrative command methods of management! You sat and awaited for an order from above on how to proceed. Now it is not that way. It is necessary to do everything independently. It turns out that a computer now is not a tribute to fashion,

but a matter of life and death: if you succeed in "making friends" with electronics, you will survive; if you do not, you will go bankrupt. However, programs are needed in order to fill computer hardware and unitized electronic frames with life. It is no secret that for the present we have few of them, and they are often poor.

And all the same it was heard at the congress: in the 1990's it is possible to expect our breakthrough into foreign markets precisely in programming. Not a timid, as now, stream of individual, most successful programs of ours, but a well-organized robust flow of high-quality software products should head there. Soviet programmers are preparing to actively participate in the international scientific and technical community.

V. Makarevich, a member of the Collegium of the USSR State Committee for Computer Technology and Information Science, shares his thoughts in this regard with our correspondent.

NTR: PROBLEMY I RESHENIYA: The typical situation is: a plant, let us assume, has purchased a computer. And immediately a need for programs appears. Where is one to get them? The search is agonizing—endless telephone calls, correspondence with organizations, business trips around the entire country.... But why, tell me, do they not turn to the GosFAP—the State Bank of Algorithms and Programs?

V. Makarevich: Today the GosFAP system, which includes 80 organizations and enterprises of various sectors, looks, I will say frankly, depressing: of the programs, which have been registered in the bank, only 500 more or less satisfy present requirements. For comparison: on the U.S. market more than 8,000 high-quality software products are actively circulating. The average rate of program duplication there comes to 100 units.

NTR: PROBLEMY I RESHENIYA: And in our country?

V. Makarevich: And in our country it is equal to only 1.7. This means that the programs, which are stored in the GosFAP, for the most part are single-use programs. We should put an end to the thoughtless squandering of intellectual resources and give up unproductive amateurish programming. A State Software System—GSPO—is needed.

NTR: PROBLEMY I RESHENIYA: You just told about the low efficiency of the State Bank of Algorithms and Programs, but are now proposing to replace one state structure with another one and, it seems, one of an even larger scale. Where is the logic here?

V. Makarevich: In what do the lessons of the GosFAP consist for us—in the faulty nature of the state approach? Remember, we really know few examples of when with its help we successfully solved in a historically short time problems that were posed by life.

But then what that is illogical in principle do you see in the organization of a state bake of programs? Every program written in the country, of course, should undergo mandatory evaluation and registration, then—depending on the purpose—they will send it to one bank or another—intersectorial, sectorial, or republic. After receiving the corresponding requests, they will copy the program and immediately send it out to all interested users. What is bad here?

NTR: PROBLEM I RESHENIYA: Why was the bank inefficient?

V. Makarevich: Here the principle of state regulation was applied in an unjustifiably narrow manner. Note, any information, particularly a program, has a very long life cycle: development—production—delivery—maintenance—application, as well as auxiliary operations: accounting, storage, and dissemination. Of this list of the states, in which programs are in succession, state regulation concerned only storage and dissemination.

NTR: PROBLEM I RESHENIYA: Why is this so?

V. Makarevich: Because today only this stage lends itself to economic evaluation—it is easy, as a matter of fact, to determine the expenses for duplication and mailing. However, these expenses amount at times to a thousandth or a millionth of the expenses for the development and production of programs, and it is they that no one in our country, in essence, is estimating and has learned to estimate.

And here is the result: thus far programs in our country are not a commodity. They do not have a owner, no one is responsible for them. It turns out that it is a matter not of the faulty nature of the state approach, but of the fact that this approach has been poorly applied.

NTR: PROBLEM I RESHENIYA: How was it possible to count in earnest on the revival in the country of the software industry?

V. Makarevich: It seems that a vital, basic stage of any economic management—production—slipped completely from our field of view. Now it is necessary to make up for lost time and to hurry up and firmly establish software development as a sector of the national economy. And, I repeat, the State Software System should become the basis of the domestic software industry. It will make it possible to increase sharply the output of software and rendered services. Their total volume by the end of the current five-year plan, as compared with the 1987 level, will increase by fivefold and by the end of the next five-year plan by fifteenfold. The labor productivity of programmers will increase respectively by two- to threefold and by four- to sixfold. The average rate of duplication of intersectorial software will increase from 1.7 last year to 100 in 1990 and to 200-300 in 1995. The quality and reliability of programs will increase. These will be real, visible steps in the

direction of the saturation of the national economy with software, the quality of which will approach the level of foreign models.

NTR: PROBLEM I RESHENIYA: What is it necessary to do so that these impressive plans would be implemented?

V. Makarevich: First of all organizational restructuring will be required. Our committee will play a guiding, coordinating role in the work of the entire system. Regional networks of software development enterprises and organizations will constitute the basis, the working backbone of the State Software System. The centers of computing services—TsVU's—which are responsible for the efficient use of programs, the comprehensive centralized maintenance of computer hardware, and the making available of computing services, will also be brought into the system. And, finally, the subdivisions that are a part of the GosFAP system.

The division of labor in software development will be organized according to the sectorial principle: the enterprises and organizations, which are a part, for example, of the Ministry of the Radio Industry, where they produce computer hardware, will be responsible for the development of so-called systemwide software—general educational disciplines of sorts, which are necessary during the operation of computers in any areas of application. The ministries and departments, which do not produce themselves, but merely use ready-made computer hardware, will be responsible for the development of application programs—these are, to continue the analogy, kinds of tekhnikums and higher educational institutions with a sectorial orientation. Thus, the Ministry of Health will be responsible for medical diagnostics programs, the State Committee for Public Education will be responsible for programs in the area of pedagogy.

Moreover, in my opinion, an all-union census of the available software, at the same time as a census of all the computer hardware, automated systems, and programmers should be made in a hurry jointly with the State Committee for Statistics.

NTR: PROBLEM I RESHENIYA: Will the results of the survey, appraisals, and proposals appear, apparently, no earlier than the end of the five-year plan?

V. Makarevich: The inevitability of some steps is clear already now. It seems, for example, to me that the time has come to include programs among the fixed production capital of enterprises and organizations, having extended to them the existing procedure of acquisition, selling, and writing off. This should prompt the consideration of not only the availability, but also the movement of software and increase the responsibility for its efficient use.

This year an experiment with the participation of the State Committee for Labor and Social Problems, the State Committee for Prices, the State Committee for Public Education, and the Ministry of Finance on the

introduction of economic methods of planning, stimulation, and management under the conditions of full cost accounting was begun within our committee. The point is that a significant sector of the State Software System will operate under these conditions: on the basis of contracts with centers of computing services the ordered program will be sought in the GosFAP and, if required, will be developed, produced, and delivered to the user "turnkey" with the fulfillment of all warranties. This work will be paid for from the funds of the client. In this way self-interest, self-sufficiency, and cost recovery will not bypass our state system and, moreover, will constitute its essence.

Computer Equipment Association Overcomes Mismanagement

18140298 SOVETSKAYA BELORUSSIYA in Russian
10 Jun 89 p 2

[Article by O. Vengerenko and V. Yefanov: "Dialectics. Restructuring. The Individual." Passages in boldface as published]

[Text] "Dialectics. Restructuring. The Individual"—this was the name of the All-Union Scientific and Practical Conference, recently held in Minsk. In terms of the number of people and scale of the problems under consideration, it was an important landmark in the theoretical interpretation of the revolutionary changes occurring in the country.

Familiarity with the practice of restructuring in labor collectives played an important role in the conference's work. How is the economic reform going? How successfully are the stereotypes of the administrative-command management methods being broken? Has restructuring affected the rank-and-file working people? These and many other questions were discussed at a "roundtable" on the "Practice of Restructuring in Labor Collectives: Problems and Contradictions," recently held at the Minsk Computer Equipment Production Association.

Choosing a Priority

The attention of scientists to this undertaking is not accidental. Whereas yesterday electronic computers were applied only in separate sectors of the national economy and science and the highest levels of economic management, today their sphere is truly limitless: from space to the work place of a designer, technologist or economist.

What condition is the Minsk Computer Equipment Association in today? A. Kharlap, general director of the enterprise, spoke about this in detail at the meeting of scientists and practical workers. However, to be brief, this priority sector is not at all in a leading position in the national economy. There are objective reasons for this. The association's head plant, imeni S. Ordzhonikidze, began work in 1956. Precisely then, in the mid-1950s, cybernetics, so to speak, received proper development. Before this, it (for well-known reasons) did not enjoy

support, and whereas it did not perish, this was thanks to the exceptional enthusiasm of bold scientists. The result: in the United States the first general-purpose computer was produced in 1945, and in our country—in 1955. A serious lag has been noted in personal computers, the production of which the association undertook only in 1984. In short, today the national economy is paying for the mistakes made in the previous choice of a general course and determination of development priorities.

That which was a universal principle was no exception for the association as well. Over the last 13 years, 91 percent of capital investments in the enterprise went into developing the production sphere. The output of computers was thus sharply increased: in the last 5-year period—by a factor of 2.6, and in the 10th—by a factor of 3.1. The new bent also gave rise to new problems, having stipulated the lag of the collective, standing on the boundaries of technical progress, in development of the social sphere. Today the capacities of the head plant have been exceeded by a factor of 10! Yet, in terms of providing the plant workers with housing and other spheres of social service, it has lagged sharply behind. As a result, at the enterprise, the specific nature of which requires the highest skills, where a quarter of the workers have higher and secondary technical education, cadre turnover among young people has reached undesirable dimensions. This cannot help but affect production. 1987 turned out to be a crisis year for the collective. The national economy did not receive millions of rubles worth of computer equipment...

Face Toward Man

"However, this year," A. Kharlap emphasized, "became a turning point. The collective managed to withstand the attack of the technocrats, greedy with a desire to further develop the production sphere. Including at the head enterprise, where the provision of sanitary and everyday facilities does not exceed 60 percent. We were certain: today it is necessary to work above all for the individual. The rank-and-file working person should believe in restructuring and feel for himself the dynamics toward improving life."

This idea stood out throughout the entire meeting between scientists and practical workers. Belief in the success of work is needed especially today, when the shortage of goods of prime necessity is felt keenly. Specific work is the best agitator. Therefore, at the association the way out of the crisis began with reconstruction of the social sphere. It is already possible to speak of results. In the provision of housing: in the course of 2 years, the rates for the allocation of apartments for the enterprise's workers has been growing by 30 percent annually. The construction of the largest polyclinic in Minsk, with 1185 visits per shift, has been started. Problems with children's preschool institutions, Pioneer camps, and physical-cultural and health complexes will be solved in the near future. An effective program for social construction until 1995 has been

developed at the association, and it has been coordinated in its basic positions with contracting and supply organizations.

However, the problem of the individual in production is much deeper. The time has come in which the plant services must work not with the collective, but with the individual person, and must solve his individual problems. A person receives some kind of work: is it profitable or unprofitable work? How does the supervisor treat him? What and who hinders the creation of a creative atmosphere in the collective? The adaptation of youth is a separate problem. Those working at the plant for the first year, are paid up to the average salary here: learn, get used to the rhythm. A young specialist starts his job not with 115 rubles, as before, but with 150. Indeed, in general they are trying to avoid equalization: if he is young and capable, his earnings become ever less dependent on length of work and position. Bonuses. Right now, the speakers said, it is practically paying for the fact that a person simply came to work. In this regard, the plant is trying to get away from stereotypes and is setting up such a system, in which bonuses should be earned.

At the meeting, the collective of the mechanization and automation department was cited as an example. Here they do not force the young specialists to carry paper: it is not so much his experience that is valued, as much as his mind, his ability to make unordinary decisions. He rapidly comes out into the light as an individual, as a creator. The department is a kind of forge of cadres for all of the enterprise's creative subdivisions.

All of this is bearing fruit of its own. Cadre turnover has decreased noticeably, new computers are being put on the production line, and the plant, in the production of personal computers, has become the base for mastering the latest personal computers. In other words, the collective will define the technical level in this question: that developed here will be produced at other plants in the country. Are these really not the best conditions for professional growth? It goes without saying, under the corresponding social policy.

We Must Implement the Laws

The scientists from all regions of the country who attended the meeting were interested in knowing how the restructuring of the economic mechanism is going in practice, under the conditions of a specific enterprise. The real state of affairs in this matter prompt serious thoughts.

"Today we are working under conditions of full self-financing and self-recovery," said S.F. Kovalev, deputy general director for economics. "As far as full cost-accounting is concerned, it does not exist for the time being. One of the main reasons is the complete absence of independence."

"Consider the alleged development of standards. Today, this is the exclusive prerogative of the ministry, which, incidentally, was stipulated by the Law on the State

Enterprise. How are the standards brought to the enterprise? On such a basis, so as to supply the enterprise with profit at the average sectorial level. And this is with a 21 percent profitability!"

"If we consider that the sector has," the chief economist said, "about 40 percent low-profit enterprises, and 13 percent entirely unprofitable, it become clear who is enjoying our profit. In this regard, the laws of cost-accounting do not take the collective's opinion into account."

The essence of cost-accounting, the speakers said, lies in strongly linking the interests of the worker to the interests of the enterprise, and the interests of the enterprise—to state interests. This connection is being violated: no matter how high the collective raises its profit due to more effective work, it knows that they will take it away.

This concerns the diktat of the center. What about, so to speak, territorial diktat?

"A year ago," A. Kharlap explained, "when considering an economic contract, the collective expressed distrust of the administration in matters of housing construction. They explained that the local soviets are taking away up to 17 percent of that built at the expense of the social development fund for the needs of the city, and 41 percent—out of the ministry's centralized capital investments. The collective was upset: why was this done without our knowledge? In general, it must be said, our laws are sometimes interpreted very arbitrarily, and for the time being there is no defense of them of the part of the legal bodies. Who doesn't dictate his will to the collective! The oblispolkom demands its own, the gorispolkom—its. And Gosplan, Gosstrib, the city planners, and the gorkom. Often, one from the other, autonomously without any coordination whatsoever with the collective. For example, a recent order from the gorispolkom: build a fish complex. However, is it necessary at this point in time to spend money on a fish complex, when more urgent problems have not been solved?"

In short, the speakers emphasized, a good law on regional accounting is no panacea. We need culture in implementing the laws, if necessary—that and their more complete development in terms of strengthening the rights of the primary link of the national economy.

Another problem is the competitiveness of the equipment being produced. The collective is faced with a revolutionary task: producing 80 to 90 percent of the computers at the level of similar world models. However, has the collective always been interested in this? The following example was given: a new computer, the mid-class YeS-1130, is being mastered at the association, the technical characteristics of which are somewhat higher than the previous model. However, its labor-intensiveness, which is typical for the first years of manufacturing something new, is higher by a factor of 3. Yet the price is in no way different from that of the previous model, which, naturally, reflects on profits. Is

the new product profitable for the collective? For the time being, no. As before, the prices are established using old methods, according to the previous analogy, and not according to the technical parameters or the effect that the new item has on the national economy, without taking actual expenditures into account. In such a situation, the interests of the parties, alas, do not converge: the old equipment gives greater profits with fewer expenses...

The conference provided much food for thought. Here is what B.D. Parygin, doctor of philosophical sciences, Leningrad, said:

"We have attended the birth of a unique form of dialogue between production workers and scientists and have received a colossal charge. Our interaction has turned into a hunger to glean as much as possible from the set of topical problems that were raised, which are already being solved. This is gratifying. We are seeing that a natural path for realizing human potential in the labor collective has been found and is being paved."

Project To Develop Russian-Language Computer Interfaces

18140314b Moscow NTR: PROBLEMY I RESHENIYA in Russian No 13 (100), 14 Jul 89 p 3

[Interview with V. Andryushchenko, head of a laboratory of the Institute of the Russian Language of the USSR Academy of Sciences, under the rubric "The Reply": "Help the Computer Begin To Speak"; date not given; first two paragraphs are NTR: PROBLEMY I RESHENIYA introduction]

[Text] Our bulletin writes much about the problems of computerization. But the following question has not yet been touched upon in a single publication: is it possible in principle to support production relations with computers by placing innumerable interfaces at all junctions? As scientists believe, during the next 50 years, for example, the number of man-machine interfaces in interactive systems will increase by several orders of 10. No forces will be sufficient to supply them with specialized languages and processors. At one time Academician A.P. Yershov proposed a solution. He voiced the idea of creating a computer data bank of Russian, thereby having posed the task to teach the computer to perceive and understand completely "business prose." What is being done to implement the idea of A.P. Yershov?

We turned with the question of our reader to the Institute of the Russian Language of the USSR Academy of Sciences. V. Andryushchenko, head of a laboratory of the institute, replies.

V. Andryushchenko: The concept of a computer data bank of Russian as the technological basis for the development of systems of communication with computers and the processing of data in natural language received broad support among specialists. The Bureau of the Language and Literature Department of the USSR

Academy of Sciences and the Scientific Councils of the Academy of Sciences for the Complex Problem "Cybernetics" and for Lexicology and Lexicography supported it. As a result the program of the development of a computer data bank of Russian of the first section for 1986-1990, which is being financed by the USSR Academy of Sciences, was formulated. And in the past 3 years several components of it have been presented.

It was determined, for example, that the entire computer data bank should consist of several component data banks, which are based on so-called source program packages of five types: text packages, dictionary packages, information and documentary packages, object-characteristic packages, and processors of Russian. The text and dictionary packages are independent and original developments of the data bank. The processors of Russian are intended both for use in the environment of the text and dictionary packages for the analysis of texts and for use in other environments. The object-characteristic and information and documentary packages play an auxiliary role, performing functions of the text and dictionary packages, which thus far have not been realized (an example of such a function is the search for objects according to their features and the making of classification calculations, in the Automatic Version of the Dialectological Atlas of Russian, which began operation this year).

In the computer data bank of Russian the linguistic concept of its terminological data bank has been developed, considerable files of terminology of several fields of knowledge have been accumulated. These files have to be converted into a multisectorial automatic terminological dictionary with diverse standard linguistic information. Many other developments, which are necessary for the establishment of applied systems of data processing in natural language, lie ahead.

As a whole for the implementation of the project of a computer data bank it is necessary to solve a number of the following problems: to develop a natural language interface for computers of subsequent generations; to completely automate editing and publishing activity; to develop a new academic dictionary of Russian of the second half of the 20th century; to develop a system of mass computerized instruction in Russian; to conduct dialectological, psycholinguistic, and sociolinguistic studies of the functioning of Russian in the late 19th century and the early 20th century; to develop electronic card files on Russian during all the periods of its history and on all its functional styles and forms of existence.

In the process of accomplishing these tasks at the USSR Academy of Sciences a system of linguistic data banks and language services was established and was included in the computer communication networks. So that people and organizations, which are interested in linguistic data and the means of their automatic processing, chairs and laboratories of higher educational institutions, publishing houses, sectorial information scientific

research institutes, foreign research centers, and individual scientists could obtain access to it through the channels of information networks.

As we see, enormous work lies ahead. It will also require vast assets. The financing, which is now being allocated to the Academy of Sciences, is obviously inadequate; therefore, the computer data bank of Russian is seeking sponsors.

Import Tax on Personal Computers Set at R5000

18140314a Moscow NTR: PROBLEMY I RESHENIYA
in Russian No 13 (100), 14 Jul '89 p 3

[Article by V. Pokrovskiy under the rubric "Reply":
"From 100 to 5,000"]

[Text] As of 1 July of this year, new custom duty rates went into effect. In particular, the duty for the importing to our country of a personal computer was increased substantially: instead of 100 rubles a package the owner of this treasure, which for the present is still rare for our country, will now pay 5,000 rubles per set.

Thus, the ominous rumors, which circulated before 1 June, concerning the fact that the duty would come to 30 percent of the black market value of a computer, which, beyond any doubt, would have closed the western computer market for us a bit more effectively than any COCOM embargo, did not prove to be correct.

But this is not much consolation. While many countries, which wish to develop informatization at home, not only do not collect duties for computers, but even give bonuses to those who transport them, we are raising the duty by 50 percent. The logic of the Main Customs Administration is incomprehensible. If its decision pursues the goal to erect a barrier in the way of the extortion of superprofits from speculation in computer, it can lead only to the reverse effect.

In essence, it is already leading to this. The price for western computers like the XT was not slow in leaping from 40,000 rubles to 45,000-48,000 rubles, there are reports about contracts, in which sums of 55,000-56,000 rubles already figure. True, for more expensive (on the order of 90,000 rubles) computers like the AT the price thus far has not yet increased, it is even decreasing somewhat, but this is explained not by the wisdom of our customs policy, but merely by the fact that high-class AT computers for the present have a small market in the USSR and cooperative members have already saturated this market—only a few thousand sets were required here.

The situation with the XT is far more complicated. Today the demand for them has far from been met. Engineers, scientists, bank and savings bank employees need XT's, they are required for management calculations, they are simply necessary in medicine. The small quantity of them, which has now appeared in our country, has merely roused appetites and, having shown the numerous advantages of western computers over domestic ones, has just stimulated the market.

The representatives of large cooperatives are calm. They have simply increased the price by at least the amount of the duty and intend to increase it further. They are confident that this will not drive buyers away: for there is nowhere to turn except to them. However, small-scale entrepreneurs, who transport a few computers each and work within their potentials (a large percentage of XT's comes via them), to all appearances, will be forced to reduce their activity—they can hardly afford such duties. It is possible to expect, therefore, a substantial decline in the importing of computers like the XT. And, according, a new increase of prices. Computer trade not only will decrease, but will also be concentrated in a limited number of hands. The increase of prices, the decrease of imports, and monopolization—should such a situation have been created?

We hope that the custom house will clarify for us this far from clear question.

Ministry Failures Becloud 'Inventors and Rationalizers Day'

18140284 Tbilisi ZARYA VOSTOKA in Russian
24 Jun 89 p 3

[Article by Ketevan Amiredzhibi under the rubric "Today Is the Day of the Inventor and Efficiency Expert": "Let Not Innovative Thought Grow Scarce!"; first paragraph is ZARYA VOSTOKA introduction]

[Text] I will begin with statistics. About 1,000 major, highly efficient inventions alone are registered annually in the republic. And today the flow of creative scientific and technical thought is not drying up. But then only tens of innovations, which are proposed for introduction, are getting to the national economy. Their authors, it can be said, were lucky in a big way: a department or enterprise, at which they took an interest in and introduced the development, was found after all. But what is to be done with the others which are also important and needed? How is one to help? For they are turning into envoys for invention affairs—they telephone departments, intercede, and demand. In the name of scientific and technical progress. In the name of the national economy. Today already in the name of restructuring.

Just recently in a conversation with me personnel of the Georgian Republic Council of the All-Union Society of Inventors and Efficiency Experts recalled again a very interesting, major intention—unique equipment for the programmed freezing of blood cells and bone marrow, which received in 1971 an inventor's certificate and was patented in the United States. I will name the group of developers—researchers of the Institute of Cybernetics of the Georgian Academy of Sciences. They are N. Mgebrishvili, I. Makhatadze, M. Rokva, Sh. Kakhiani, A. Kiselev, S. Oganov, G. Bakuradze, and P. Badalov. Their invention is outstanding—a completely automated system, which ensures the execution of any programs on the state of biological products and greatly surpasses in the most important indicators the most advanced developments of this direction abroad. This equipment, I repeat, has many merits, the economic impact is high—several hundred thousand rubles a year from the use of just one instrument. The interest in the invention was universal: high ratings were given during clinical tests, awards rained down at prestigious international exhibitions. As a result, by 1983 it had been possible to produce...seven complete sets of equipment—but this is nothing, considering the enormous demand for it. During these years not only the inventors themselves, but also the State Planning Committee, the State Committee for Science and Technology, the All-Union Society of Inventors and Efficiency Experts, and journalists of the republic tried in earnest to interest industry in the development. Alas, with a zero result. Is it worth it to continue this sorry list of unlucky inventions and, hence, unlucky inventors?

Inventors and efficiency experts are greeting their professional holiday, let us put in this way, not very joyfully.

And is it possible to regard it as a professional one? Quite recently passions raged over the draft of the USSR Law on Inventive Activity. Not every bill has caused such an explosion of not only professional, but also public interest. This is understandable, considering how much in our life depends on the level of scientific and technical progress and on its pace. The draft of the Law—a massive, unintelligible, in many respects declarative document which strongly smacks of administrative command traditions—was literally buried in amendments, refinements, and remarks. Not having stood up to public pressure, its anonymous writers undertook its refinement, and the draft disappeared in infamy in unknown offices. We will not, therefore, return again to its details and discuss the particulars. The main thing is that in essence the draft of the Law on Inventive Activity in any event was oriented toward the system of economic relations, which for the present exists in the national economy, and again placed the author of an invention in a subordinate, dependent, humiliating position. The previous one (the Law that is now still in effect) enables state organizations for 15 years to take the inventor in with promises to introduce the innovation, as well as makes it possible in the final analysis to do nothing. The bill confirmed word for word the right of the bureaucrat to be unobliging and irresponsible. Because it was written not with allowance made for the force of the conviction in the necessity of technical progress, which comes from the natural economic need of dynamically developing production for constant modernization, but with allowance made for conviction by force, which makes this process coercion for the enterprise and, hence, sacrifices its fate and the fate of the proposed innovation to a deceitful accounting figure. Are the usually fulfilled plans on the introduction of new equipment, after which once day the enterprise "suddenly" finds itself faced with the necessity of radical modernization, really not such in essence? That is why the opinion of numerous voluntary experts of the bill was also so unanimous: the Law in the submitted version has to be introduced without particular prospects of success in exactly the same way as inventors usually introduce their innovations—with the same difficulty and modest impact. Another bill—on product quality and the protection of the rights of the consumer—which has a close bearing on the problems of the development of innovations and is aimed according to its basic idea against the dictation of the producer and monopolism in industry, which has become an insurmountable obstacle in the way of scientific and technical progress, was also a failure for the same reason.

But one must not, apparently, rely only on economic reform and the Law on Inventive Activity. Patent culture and patent discipline, which also make it possible precisely to show the scientific and technical commodity to advantage, are also required. But exactly they are still lacking. It is possible to judge this from the modest number of licenses for inventions, which the republic has succeeded in selling to foreign countries. The lack of patent study traditions makes the procedure of drawing

up documents for inventions truly agonizing and at times insurmountable and takes from researchers and innovators the design to have anything to do with the sale of licenses.

"In 2 years we sold four licenses to Cuba and France and two to Japan," A. Siradze, head of the chair of machine building technology of the Georgian Polytechnical Institute imeni V.I. Lenin, told me. "The precision surface-grinding machine aroused much interest. In the end the higher educational institution received currency, and everyone was quite satisfied, but what this cost us, the developers! The procedure of drawing up licenses wore us out so much that we will hardly undertake their sale again."

The Institute of Technical Creativity attached to the All-Union Society of Inventors and Efficiency Experts, at which there is, incidentally, a specialization in patent studies and tens of patent experts are being trained, is operating in the republic. But how do things stand with their use and job placement?

"Changes for the better are visible," Candidate of Technical Sciences T. Shilakadze, rector of the institute and honored inventor of the republic, states, "but one cannot say that this problem has been solved."

We find confirmation of these words by becoming acquainted with the patent study services of ministries and departments, many of which are not fully manned. But just how then, without patent analyses is one to appear on the foreign market of goods and technical ideas? Many cases are known, when the patent expert has revealed to the developers of an innovation its unique nature and great competitive ability on the world market. We do not have the right to ignore this opportunity; this chance today, when foreign economic relations are being stimulated so. But enterprises and facilities nearly always delay and stick to what is customary. But what is customary is unattractive. For years in a

large number of ministries and departments they have not used a single invention and have not been adjusting the mechanism of the planning and financing of inventive and efficiency promotion work, the failure to assimilate the assets allocated for these purposes has become chronic. Not finding reciprocity among large industrial enterprises, inventors often find it in scientific and technical cooperatives, of which there are more and more in the republic, or undertake themselves the establishment of such engineering firms. It is only possible to welcome such a thing, but for the cooperative, even a large one, the ceiling of opportunities is such that its scale simply does not accommodate many significant developments, in such cases one cannot manage without the assistance of industry, but for the present it is in no hurry. All this, of course, does not improve the mood of inventors and efficiency experts. So did inventive thought, perhaps, fall asleep pending radical changes in economic customs and a full-fledged law, in short, better times?

"Oh, come on!" exclaims I. Khazaradze, chairman of the Georgian Republic Council of the All-Union Society of Inventors and Efficiency Experts. "As if you can stop it! Our recognized leaders, Honored Inventor of the USSR A. Kurdadze, Honored Inventor of the Republic V. Mgedlishvili, and many, many others, whom I congratulate on the holiday, are full of strength, energy, and ideas. Many interesting proposals are being received from our young people."

It is wonderful that inventive thought is accumulating and is seething, only there is not yet anything to do with it. I want to hope: soon, very soon the dam, which consists of stale dogmas and restrictions, conservatism and indifference toward our inventors—our national property—will collapse, and the invigorating cascade of scientific and technical ideas will transform the economy and our life. Thank goodness, we do not have to employ talented people.

Computer Contract Signed With FRG's Siemens

18140280a Moscow IZVESTIYA in Russian
18 Jun 89 p 6

[Article by I. Andreyev: "With the Participation of the Siemens Company"; first paragraph is IZVESTIYA introduction]

[Text] The West German Siemens company has confirmed its loyalty to its old—from the last century—market, having established a joint venture with the participation of several Soviet organizations and the British firm Afro Arab.

Why will the venerable firm, which back in 1853 stretched a telegraph line from Petersburg to Kronshadt, not directly deliver its computers and the technology of their production to the USSR, as it had always acted, but with the mediation of a company that hardly anyone knows?

"But it costs considerable currency assets to saturate to some extent our educational and research institutions with advanced computers," says O. Petrov, RSFSR deputy minister of higher and secondary specialized education, a department that has become a part of the joint venture. "It turned out that it is possible to attract this capital on the side and then to settle accounts with the receipts from the sale on international markets of what we have. And we do have something to offer: high-quality chemical reagents to educational purposes, ultrapure chemical substances, software for computers. Afro Arab is making available to us the assets for the purchases from Siemens of personal computers, their elements, and the technology of producing complex electronics. By means of its interest-free credit we are modernizing six enterprises for the production of reagents and ultrapure substances and other products. We, unfortunately, are not the best of businessmen, and for that reason Afro Arab will engage in their sale for currency."

"We are to implement the computer portion of the program of the new joint venture," says B. Chernov, general director of the Orbita Production Association of the USSR Ministry of the Communications Equipment Industry. "It is important, after all, not simply to purchase such equipment in the West, but also to produce it ourselves and to organize service and the training of personnel. In cooperation with Siemens we plan to assemble in the USSR computers made out of components with their gradual replacement with domestically produced elements. We will also set up a line for the production of household radio and video equipment, telexes, and telephones.

"Siemens has long-standing business contacts with your country," says company vice president Rainer Hallauer. "Our contract on the joint venture is the best confirmation of the constructive understandings which were just reached between the leaders of the USSR and the FRG during the visit of President Gorbachev to Bonn. We and

our Soviet partners understand each other perfectly well. I am delighted with the greatest professionalism of your programmers."

"Our firm has been operating on Soviet markets since 1986," Afro Arab President El Samuel Mansur Osman comments on its role in the concluded contract. "We purchased for sale abroad fertilizers and motor vehicle tires. We helped the Avtoeksport and Traktoroeksport associations to appear on the markets of Near East countries. We delivered from Arab states patients for the clinic of Professor Svyatoslav Fedorov and, on the other hand, made arrangements at foreign medical institutions for Soviet children suffering from serious diseases...."

Soviet-Italian Information Service Agreement Signed

18140280b Moscow IZVESTIYA in Russian
26 May 89 p 3

[Article by S. Leskov under the rubric "Panorama of the News": "Mathematics: Export and Import"; first paragraph is IZVESTIYA introduction]

[Text] An agreement on International Information Service, the joint Soviet-Italian venture, has been signed in Moscow.

Scientists believe that in our age the level of development of information science determines the economic potential of a country. Scientific and technical progress is complicated to a significant extent, if information exchange takes place at a slow pace, if control systems are built according to the principles of yesterday. Unfortunately, in this respect we have nothing particular to boast of—the shortage of high-quality computer hardware and, consequently, software is hindering the development of many sectors of production and the national economy. This is all the more regrettable as the skill of Soviet programmers and specialists in computer technology enjoys a good reputation in the world.

Restructuring and the rapid development of all sectors of the national economy are forcing us to actively seek opportunities to correct the situation. The joint venture International Information Service, which has been established by a subsidiary of Olivetti, the largest company for the production of computer hardware in Europe, and the All-Union Scientific Research Institute of the Automation of Control in the Nonindustrial Sphere, will specialize in the development and delivery of programs, information systems, and control systems and in the making available of a wide range of scientific and technical and educational consultative services in the area of information science.

As firm president F. Debenedetti stressed, Olivetti is counting on the high level of training of Soviet specialists and on new ideas in the area of computer technology, which will help to increase the competitive ability of the joint product. It is also important that for the USSR the

exports will be ecologically clean and will not be connected with the export of a material product. The joint venture will operate in two directions—appearance on the European market and the assimilation of the broad potentials of the Soviet market.

The signed agreement is the logical result of 10 years of cooperation between Olivetti and the All-Union Scientific Research Institute of the Automation of Control in the Nonindustrial Sphere. The first major joint project was carried out on the order of the USSR State Bank. All the departments of the Savings Bank of Sevastopolskiy Rayon of the capital now serve 300,000 people with the use of a data processing and computing system, which was made on the basis of Soviet-Italian equipment and software. Another computer network consisting of 120 computers, which was developed by the partners, serves the well-known Luks Fashion Center.

"Soviet scientists are merging with the world scientific community and are ceasing to work in isolation," stressed Professor V. Solomatin, director of the All-Union Scientific Research Institute of the Automation of Control in the Nonindustrial Sphere. "From the example of the agreement of the All-Union Scientific Research Institute of the Automation of Control in the Nonindustrial Sphere and Olivetti it is evident how restructuring in the USSR and the warming of the international political climate are creating favorable conditions for the development of scientific, technical, and economic ties, which, in turn, are contributing to the irreversibility of restructuring."

The joint venture proposes to direct efforts at the development of information programs in the area of environmental protection, banking, medicine, transportation, and construction. The volume of joint development is about \$20 million a year.

Problems With Soviet-British Computer Joint Venture

18140280c Moscow *EKONOMICHESKAYA GAZETA*
in Russian No 17, Apr 89 p 23

[Letter to the editors by O. Volodina, A. Yurtaykin, M. Ivanov, I. Malich, Yu. Kuznetsov, and R. Kostin, staff members of the Dinamika joint venture, under the rubric "Direct Ties": "Why Was Dinamika Established?"; first two paragraphs are *EKONOMICHESKAYA GAZETA* introduction]

[Text] Joint ventures with foreign participation have finally acquired broad rights in matters of the hiring and firing of personnel and the remuneration of their labor. Joint ventures, which are free of the fetters of obsolete instructions, can become pioneers in the area of not only technology, but also on-the-job labor relations and the assurance of the interest of every staff member in the common cause.

But great rights are also great responsibility. Not all managers have yet become accustomed to working under

the conditions of democracy and glasnost and close cooperation with the labor collective. For example, the conflict, which a letter to the editors related, testifies to this.

The joint Soviet-British venture Dinamika is one of the first in the Soviet Union. And more precisely, the 20th one. It was registered under this number by the USSR Ministry of Finance in December 1987. It was presumed that Dinamika would develop training packages for foreigners studying Russian and prepare a computer appendix to textbooks. On the cover of the textbook there is a pocket. In the pocket there is a diskette. On the diskette there are "living pictures" and texts of explanations to them, which taken together are called the "training package." Therefore, during the drafting of the constituent documents and at the talks with the foreign partner this type of activity was taken as the basis. Particular attention was devoted to the achievement of the necessary level of the program product, which would make it possible in the future to appear on the foreign market.

A person, who understands economics and the specific nature of the activity of the venture and has a good idea of how to organize the work of the firm, was appointed general director of Dinamika. A clear strategic line of the activity of the venture, which is aimed at the achievement of its goal—the development and production of training packages—was specified. At that time an interview with the British partner of Dinamika, the Gerald Computers company, was published in the newspaper *PRAVDA*, after which proposals on cooperation and the conducting of joint development, as well as already prepared programs were sent to Dinamika.

In a very short time it was possible to organize promising cooperation with a number of Soviet and foreign organizations. Thus, jointly with the Moscow State Pedagogical Institute imeni V.I. Lenin Dinamika developed a "skate" program for the taking of tests and examinations on various educational disciplines. The joint venture began to produce for sale on the foreign market a "computer game complex," which was developed by the Central Scientific Research Institute of Electronics jointly with the Scientific Research Institute of Pre-school Education and includes a sports hall, a game hall, and a computer hall, the equipment of which is united by a common method of the training process. Dinamika took upon itself the bringing of the program product up to international requirements, as well as the marketing and selling. Finally, an interesting proposal was received from the Ilmenau Technical College (the GDR). Since 1981 the training systems developed by the college have been used in the GDR and Bulgaria, but it has not been possible to appear on the western market. It was proposed that Dinamika give the developments a "commercial form" and engage in their sale in foreign countries.

From the standpoint of the British partner of Dinamika these and other projects were very promising and in case

of their implementation in the immediate future could already yield a substantial currency profit.

But alas.... At the same moment, when the work, it would seem, had resumed its natural course and Dinamika began to pick up speed, the board of the joint venture made the decision to remove the general director, having given as the reason for this the fact that the venture was moving not in the direction in which it was necessary to move. It turned out that 2 months was sufficient time to cease the development of the directions that in the constituent documents held the main place. A completely new task was set for the collective: the computerization of publishing processes. M.A. Kovalevskiy, chairman of the board of the joint venture, reported that he was prepared to conclude a contract for 1989 between the Mashinostroyeniye Publishing House (of which he is the director) and Dinamika.

As to the collective of highly skilled programmers, it was suggested to them to acquire the new profession of...merchants and "to seek publishing houses that wish to computerize."

In 2 months, true, the second general director, who had simply spent all this time in "performing the duties," was also removed from the position. This time without an explanation of the reasons. While the next one was presented to the collective. As to the directions of the activity of the venture, they changed fundamentally. In spite of the start, which had been made by the specialists of Dinamika on the computerization of the Mashinostroyeniye Publishing House, a contract was not signed with the publishing house. As it turned out, it was not at all interested in this.

And in general it is not longer a matter of any computer computerization of publishing processes. And what for, when it is possible to live in clover on simple mediation. Computers with a good coefficient, which have been purchased for hard currency, are sold to various organizations, and how they are sold there—they literally tear them from one's hands. And no trouble on the computerization of publishing houses! It turned out that it is possible to live very well on commissions.

Such a change of priorities in the activity of the venture raised the main question: What is to be done with the recruited programmers, who needs them after the completion of the contracts for 1988? And now under the supervision of the new general director there is already being studied the question of establishing cooperatives attached to the venture, to which they will "take away" all the programmers. Only intermediary merchants, who will handle "currency" matters, will remain in Dinamika. As for the rubles, there will be its own "cooperative" programmers for that. For the prices for the development of the program product are now quite high. The idea of the illegality of such actions of the administration, which, incidentally, kept all questions of the prospects of the development of the joint venture a big secret, also did not occur to the programmers. But the

world is overflowing with rumors, and the leaking of information did its job. And the programmers began running to the only sensible person—the British partner, to whom they proved the irrationality of such a step. The British partner proved to be most consistent in the defending of the interests of the programmers and in the necessity of developing a competitive program product. However, the management of the board succeeded in outwitting everyone.

The labor collective was invited to a meeting with the chairman of the board, at which it was reported that all the staff members are to be switched to 1-year contracts. A new manning table is being introduced. The general director will personally appoint staff members to new positions, establish their salaries, settle questions of the extension of the contracts with staff members for the next period, establish the amount of the bonus, as well as withhold the bonus. Those wishing to remain at Dinamika will work only on two conditions. Let those who do not agree look for another place of work. The time has come to work "in the western way." The chairman of the board stressed that he had heard enough about tempestuous meetings in the collective. Henceforth the meetings are abolished. The director decides everything. If you do not like it, leave. For you this is not a Soviet enterprise. It operates according to different laws.

After his statement board chairman M.A. Kovalevskiy wished to answer questions, if anyone had such. The collective was silent. After a lengthy pause the timid question of the secretary of the party organization on the participation of the workers in management followed. The response: no one is forbidden to turn to the board with his suggestions, remarks, and criticism. To the no less timid question of the chairman of the trade union committee, whether the board by its action is violating some paragraphs of the Labor Code, the constituent documents of the Dinamika joint venture, and the decree of the USSR Council of Ministers on the establishment and activity of joint ventures, there followed the response that there are secret paragraphs of the decree of the USSR Council of Ministers, which allow the board to do everything it considers necessary. No more questions followed. On 3 January 1989 the chairman of the trade union committee and his deputy were informed that they were being dismissed.

What do we have as a result? All the work on the development of competitive software has now been halted. The "skate" program, for example, which has been completely finished, has been translated into English, and has covering documentation and advertising prospectuses, exists in a single copy, and no one is dealing with its subsequent fate. The cooperation with the Central Scientific Research Institute of Electronics died peacefully, and we do know where the already developed set of programs is. A response has not been made to recent letters from the GDR. The themes and ideas proposed by the British partner on the preparation of programs, which, in its opinion, could undoubtedly be

sold in the West, are not even being discussed. In short, today we have nothing to offer the world market....

It would be interesting to know what the policy of M.A. Kovalevskiy with respect to Dinamika would be, if he had invested in it his own money or if only the money of the so-called founder—the Mashinostroyeniye Publishing House, of which he is the director? For the share of the Soviet participant in the authorized capital stock is money, which was allocated by the USSR State Committee for Publishing Houses, Printing Plants, and the Book Trade for the establishment of Dinamika. As to the Mashinostroyeniye Publishing House, it does not have at all a currency account. And how is one to distribute the share of the profit, which is due to the founders of the joint venture? It is clear how to distribute it to the foreign partner, he paid his dues to the venture. But for what should the profit go to the Mashinostroyeniye Publishing House?

And is not the proposed style of work "in the western way" reminiscent of the administrative command method of management, with which we are so closely acquainted?

[Signed] O. Volodina, A. Yurtaykin, M. Ivanov, I. Malich, Yu. Kuznetsov, R. Kostin, staff members of Dinamika joint venture

From the Editorial Board

We asked Diana Miller, a representative of Gerald Computers, which is the founder on the British part, first deputy general director and board member of the venture, to comment on the letter of the staff members of the Dinamika joint venture to the editorial board of *EKONOMICHESKAYA GAZETA*. Here is her opinion on the problems raised:

"Unfortunately, Dinamika today is a ship without a captain. I am the first deputy general director, but do not receive any information on commercial and management questions and in practice have been eliminated from decision making.

"All the projects, for the sake of the implementation of which Dinamika was established, have been abandoned. Instead of this the Soviet management of the venture is striving "to make money" quickly by, in my opinion, not always acceptable methods. The creative work of the venture, which, no doubt, would be profitable, has been relegated to the background. As soon as the development of the program product began to yield the first results, it was halted. My repeated requests to continue the work on, in my opinion, noteworthy programs are being ignored.

"I have never had occasion to see such a poor style of management as at Dinamika and such disgraceful treatment of personnel, from whom all decisions are being kept secret. Incidentally, as they are also from me. I will

not hide the fact that I am very worried by the 'dictatorial' style of management, which is being spread at Dinamika by its general director and board chairman."

Such is the impartial evaluation of the "western style" of work, which is flourishing at the joint venture, on the part of the western partner himself. What is it possible to add to this?

The process of establishing joint ventures in the USSR is gaining strength. This business is new, and our economic managers, who are embarking on this in many ways unknown path, should understand that they represent on the international arena not only themselves and their firm, but also the entire Soviet Union. More than 10 joint ventures have been established with British firms, many British businessmen are considering plans of appearing on the Soviet market, especially since the successful summit meeting, and, of course, are vitally interested in the experience of the "pioneers." And what information can they get from the first British company that established a joint venture in the USSR, that is, Gerald Computers? Moreover, in one of the most rapidly growing spheres of international entrepreneurship—software production.

The prestige of Soviet programmers today in the West is extremely high. The French newspaper *QUOTIDIEN DE PARIS* recently wrote in this regard: "The strength of Soviet specialists consists in the fact that due to the lack of advanced information aids and computers they have to invent such algorithms, which lead Americans to perplexed admiration. This is prompting several large firms of Silicon Valley to send their emissaries on the sly to socialist countries for the recruitment there of engineers, who are specialists in information science, and the conclusion of agreements on subcontracts for the production of the most complex subsystems of American programs. Back 4 years ago no one, it would seem, could have foreseen such a turn of events."

This is how domestic developments are rated in the West! And at the same time the venture, which was specially established for the purpose of advancing them to the world market, is curtailing the activity in this direction. Is this practical?

And another remark. When this report had already been prepared for publication, the decree of the USSR Council of Ministers "On Steps of State Regulation of Foreign Economic Activity" appeared. In it, in particular, it is stated that joint ventures can export only products manufactured by them and services performed by them and can import products only for their own needs. Special permission is required for the performance of intermediary operations.

Yes, the policy of the present management of Dinamika, which is subordinate to quick "enrichment" by means of mediation, proved to be nearsighted.

Official Discusses Soviet-International Patent Trade

18140312 Moscow PRAVDA in Russian 30 Jul 89 p 4

[Article by M. Gorodisskiy, general director of the Soyuzpatent All-Union Association of the USSR Chamber of Commerce and Industry: "The Patent for Development"]

[Text] "I read that the rapid economic development of Japan was connected, besides other things, with its far-sighted policy in the purchase of licenses for technologies that were advanced at that time. Now the Japanese themselves are selling licenses and are earning rather good money on this. It would be interesting to find out what work is being performed in our country in this direction."

[Signed] I. Sinitsyn

Kharkov

"Indeed, Japan took its first major steps on the development of the economy on the basis of the latest equipment in many respects owing to effective purchases on the market of patented inventions," says M. Gorodisskiy, general director of the Soyuzpatent All-Union Association of the USSR Chamber of Commerce and Industry. "By modifying the purchased technologies, and less money is spent on this than on development, Japanese firms themselves gradually became the holders of patents for the most advanced products and equipment. Precisely this also enabled the Japanese (of course, along with other factors) to make an abrupt leap and to appear among the leading group of states in exports."

"Our country has a powerful scientific and technical potential—and the success of many of our developments and inventions on foreign markets is evidence of this—but the picture as a whole is far from satisfactory. One has occasion to be faced with the fact that Soviet departments often acquire abroad goods and equipment, as they say, 'from the store shelf'—they get what, perhaps, is a little less expensive, but what is not backed by patents, that is, is already obsolete, and what they want to get rid of, having set up the output of more advanced products. Patents are usually in effect 15-20 years, and we are orienting the managers of our enterprises toward the acquisition of such developments and technologies, which have been patented quite recently and, therefore, are most advanced and up to date. It turns out to be a little more expensive, but, undoubtedly, more profitable, if you think not only about today, but also about tomorrow. After all, by buying obsolete equipment, we are consciously dooming ourselves to lagging behind. About 2,000 firms from 60 countries are patenting their inventions in our country in the hope of setting up various forms of cooperation, but our enterprises and departments for the present are obviously using these opportunities inadequately."

"Let us now take the opposite process—the export of Soviet inventions. Here our scientific and technical potential is being realized intolerably inefficiently. In a year 70,000-80,000 inventions are registered in our country, but only 1 percent are patented abroad. The figures speak for themselves: we are not obtaining much of what we could have."

"What is hindering us? First of all the lack of a mechanism that stimulates inventive activity. Our scientific and production collectives also do not have sufficient interest in selling their developments and inventions abroad. I hope that the adoption this year of the Law on Inventive Activity in the USSR will substantially improve the situation."

Cooperation Between Soviet, British 'Nature' Journals

18140313 Moscow PRIRODA in Russian
No 6, Jun 89 pp 61-64

[Interview with John Maddox, editor of NATURE, under the rubric "The Organization of Science": "PRIRODA-NATURE"; date not given; first 22 paragraphs are PRIRODA introduction]

[Text] The British-Soviet dialog in the area of science is becoming more lively. The contacts between scientific research institutes are expanding; joint programs are being established. The exchange of scientific associates on a noncurrency basis has increased. Individual trips of scientists on the invitation of colleagues from both sides have become more frequent. As a whole it is possible to say that the development of Soviet-British scientific ties has begun to pick up pace and, what is especially reassuring, is acquiring a more intensive psychological tinge, which is possible to characterize as mutual interest, mutual friendliness, and mutual openness.

The USSR Academy of Sciences and the London Royal Society are exerting efforts to stimulate this process by joint steps. For this purpose the leadership of the main scientific organizations of both countries in 1987 signed in London the Protocol on the Development of Scientific Cooperation Between the USSR and Great Britain. One of the points of the understanding directly concerns PRIRODA. Both parties expressed the wish for the regular exchange of materials for publication in PRIRODA and NATURE.

This wish was greeted in the editorial office of our journal with great satisfaction. A counterresponse also followed on the part of NATURE. How should our cooperation be carried out? It was decided that PRIRODA and NATURE are to exchange materials, which have gone through all the stages of preparation for printing, but have not yet been published. Some difficulties of this exchange involve the peculiarities of each of the journals. NATURE is a journal of priority publications, PRIRODA is a popular journal, in which scientific reports not previously published are rarely printed.

NATURE editor John Maddox often comes to the Soviet Union for meetings with Soviet scientists and on each of his arrivals is a guest of PRIRODA. He displays an unconcealed interest in everything that is happening in our science and scientific milieu. One of the issues of NATURE in 1987 was devoted to science in the USSR, its organization and leaders, its achievements and difficulties. It is possible to agree or not to agree with the coverage in NATURE of various aspects of our scientific life, but the aspiration to understand it and to make it comprehensively to English readers is obvious.

The desire of NATURE to bring western science closer to Soviet scientists is also indubitable. Recently the journal officially declared that it is assuming the role of an active informal intermediary, which is prepared to serve the mutual good, and proposed a specific program, with which we would like to familiarize our readers. Let us cite its basic, constructive part.

East-West Contact Through NATURE

It is clear that much still has to be done before the relations between the Soviet and western scientific communities become as close and constructive as they should be.

In order to aid the development of this process, NATURE intends to take two practical steps.

First, we will try to a greater extent than before to draw attention to important directions of the research of Soviet scientists. This will first of all benefit western readers. The conversations at the USSR Academy of Sciences and with individual scientists inspire hopes that it is possible to do much that is useful in this direction.

Second, our journal intends to establish an informal information network, which will be called "East-West Contact Through NATURE." Assistance to professional researchers with common interests in the search for scientific contacts with each other will be the main task of the network. NATURE will serve only as a kind of mailbox, mainly relaying information supplied by the readers themselves. Along with this we will also use our own network of scientific consultants to find scientists who are potentially interested in contacts with our specific correspondents.

Readers, who wish to participate in our program, should report in writing their names, addresses, telephone numbers, and fax numbers to one of our editorial offices in London, Munich, Tokyo, or Washington. We guarantee that this information will not be used for any other purposes.

It is necessary to indicate the area of one's interests (as specifically as possible) after an outline that can have the following form:

A request for information or assistance.

A report on the availability of specific information in the East (or West), which might not have entered the sphere of attention, or an offer of assistance that can be given.

An offer to contribute to the establishment of a potential source of request information or potential assistance.

It is not expected that the framework of exchange would be limited in any way. We anticipate that initially requests for information, possibly requests for software, which has been specially developed for basic research, will be received. The respondents to requests should realize that precisely they, and not NATURE, should obey the national legislation that is in effect in one country or another.

Particular attention will be devoted to the affording of opportunities for cooperation with the West of Soviet scientists from universities and less well-known scientific research institutes.

As a rule, no fee will be collected for information or materials, which have been received within the framework of the proposed exchange. However, circumstances, when two participants agree on the making of some payment, may occur.

NATURE will publish reports on the development of the exchange program every 3 months.

(NATURE, Vol 337, No 6202, January 1989, p 1)

While informing our readers about the intermediary project of NATURE, which, we hope, will become another catalyst in the development of the cooperation of Soviet and foreign scientists, we direct attention to the fact that NATURE regards as the first step of its new program the attraction of attention to the important directions of the research of Soviet scientists. This section of the program follows both the path of the regular work of PRIRODA and the path of its contacts with NATURE, which, unfortunately, are being developed not as intensively as would be liked.

Considering NATURE, nevertheless, to be our business partner, we would like to acquaint our reading audience more closely with the life of NATURE and with the opinion of those, who produce it, about their journal and about PRIRODA. We asked Dr. Maddox during a visit to our editorial office to answer a few questions.

PRIRODA: Mr. Maddox, how would you define your journal?

J. Maddox: The weekly NATURE is the synthesis of a scientific newspaper, a popular science journal, and a scientific journal. Everyone now has little time, therefore, we are trying to print short, 200-word, most recent reports from laboratories of the entire world. They take up about two-thirds of the entire contents of the journal. In addition, we publish popular notes, also comparatively short articles, which tell scientists about the work of their colleagues from other fields of science, and survey articles. Moreover, we have the section

"Opinions," in which questions of scientific policy and correct or incorrect decisions of the government, which concern the scientific sphere, are discussed. In short, NATURE holds a special position between scientific and popular science journals.

There is another peculiarity. Our journal, perhaps, is one of the most international journals in the world. NATURE is published now in four countries. In addition to Great Britain, it is printed in the United States, Japan, and China. The total circulation is more than 40,000 copies, 21,000 copies are sold in the United States, 12,000 are sold in the FRG, 3,500 are sold in Japan, and 6,000 are sold at home, in Great Britain. In the Soviet Union about 100 copies are being disseminated. According to our estimates, approximately 25 people read each copy of NATURE.

PRIRODA: NATURE has been published a long time. Was it always like that?

J. Maddox: Our journal was founded in 1869 by C. Darwin and T. Huxley. And in those distant years this was a weekly which, true, mainly published reported on events of such a sort as the arrival of the cuckoo in Sussex. The theory of evolution during those years attracted particular attention, and observations of living nature were very popular.

At the end of the last century J.J. Thomsom, whom even school children now know well, for some reason wrote an article not on the arrival of the cuckoo in Cambridge, but on his discovery of the electron. The era of great discoveries in physics started, and we began to print original scientific reports. With time their level rose so high that it opened the way for many authors to Nobel Prizes.

PRIRODA: Do you not want to say that in NATURE they "make" Nobel laureates?

J. Maddox: There is some grain of truth in your joke. At the beginning of the century articles of E. Rutherford on the scattering of alpha-particles and reports on the displacement law in radioactive decay—the Soddy-Fajans law—were printed in NATURE. The publication of P. Blackett, which proves the existence of the proton and the artificial transformation of elements, appeared in the 1920's. The 1930's in general became the triumph of physicists. P. Blackett and G. Occhialini confirmed the discovery of the positron, J. Chadwick discovered the neutron, J. Cockcroft and E. Walton developed the high-voltage cascade generator, L. Meitner and O. Frisch explained the experiments of O. Hahn and F. Strassman on uranium fission. The journal NATURE reported all this for the first time. In the 1940's H. Yukawa, L. Kowarski, and H. Halban, who proved the possibility of a chain reaction in a system of uranium with heavy water, and C. Powell, who established the difference between pi- and mu-mesons, published works here. In the 1950's the famous article of J. Watson and F. Crick on DNA appeared in the pages of the journal, in the 1970's D. Baltimore and H. Temin published a work on reverse transcription. This is just a brief list of the

remarkable publications, which occurred to me straight off. The majority of them brought their authors Nobel awards. But this list does not lay claim to being complete.

PRIRODA: But how is one to explain that in the late 1930's NATURE rejected an article of P.A. Cherenkov—a work which subsequently not only was awarded the Nobel Prize, but also literally caused a revolution in experimental elementary particle physics?

J. Maddox: Anything could happen. In the 1960's NATURE did not accept for publication a report on the work of H. Krebs, who later received the Nobel Prize for the discovery of aerobic oxidation reactions. One can only regret this.

PRIRODA: But do you not regret that last year you published the sensational, but quite dubious report of J. Benveniste on the effect of an incredibly diluted serum on human cells?

J. Maddox: No, for we published this article on specific conditions: a commission of experts should have conducted a check of the results of Benveniste at his laboratory. In the next issue of NATURE a report of the commission, which came to the conclusion of the invalidity of the results of Benveniste and of the noncritical attitude of the authors toward their results, was published. I am not certain that we succeeded in changing Benveniste's mind, but rumors that he has changed the field of his activity have reached me.

PRIRODA: PRIRODA is closely following your publications. And in No 11 for 1988 we published an article of A.Ya. Kulberg, who does not deny the possibility of such an effect, but gives it an explanation, which differs both from the interpretation of Benveniste himself and from the conclusions of the commission. Perhaps, this would interest you. And in general we would like to familiarize our readers with your opinion about PRIRODA and its place among scientific and popular science journals.

J. Maddox: In my opinion, you are closer to the American journal SCIENTIFIC AMERICAN than to us. For example, you hardly have news in the understanding of NATURE, that is, original scientific publications. Your rubric "Science News" is popular abstracts of original scientific reports. Your survey articles are longer than is customary in NATURE. Such, evidently, is the style of your authors.

But we and PRIRODA have a similar reading audience—mainly professional scientists. True, we, unlike you, devote more attention to questions of scientific policy, yours as well, constantly informing our readers about important organizational changes at the USSR Academy of Sciences. Consider this criticism meant for you or simply good advice. And another thing. PRIRODA lacks promptitude.

Here the time of publication looks approximately like a Maxwellian distribution, the peak of which falls to

articles which have been at the editorial office not more than 2 months. A portion of the materials appear 3 weeks after arrival at the editorial office, while another portion, also a small one, appears in 4 months, but no later.

Having repeatedly visited your editorial office, I am not surprised that your technological cycle is too long. How is it possible in our times to work efficiently without a personal computer, a telex, and a fax machine, not to mention a simple xerox machine? I also do not part with my computer, as you see, on business trips. Incidentally, this is a misfortune of all Soviet science.

PRIRODA: In 1987 you devoted a large part of one of the issues of NATURE to Soviet science. What was the reaction to these publications?

J. Maddox: In England my publication, about which you are speaking, was awarded a special prize as the best article of the year on a scientific theme. It seems that many people read it. For the interest in everything happening in the Soviet Union is enormous. I should admit that the survey was critical, but by no means hostile. In it I attempted to analyze truthfully and impartially various aspects of Soviet scientific policy, which, it seems to me, is far from incontrovertible. Of course, your scientists have great achievements, but many of them belong to the past. One of the causes of such a situation is the scarcity of technical equipment. It seems that in this sphere western scientists have such advantages which I did not even expect to find. Now it is clear why your theorists are better known in the West than your experimenters. In my opinion, Soviet science is in a very difficult position. But I want to stress once again that I like Soviet scientists very much and believe that under the conditions of restructuring they will be able to work with greater efficiency and to return the former prestige to their science.

PRIRODA: The broadening of international contacts in science, for which we and you are striving, could play a rather important role here.

J. Maddox: Certainly. For science by its nature is international. Evidence of this is every issue of the journal NATURE. The more closely the scientists of different countries are united, the more science gains. That is precisely why the barriers between scientists of East and West, which existed in recent times, although, as in quantum mechanics, these barriers were not absolutely impenetrable, so depressed us.

Soviet science could not take full advantage of the achievements of world science, while western scientists did not always know sufficiently well the achievements of their Soviet colleagues. This did not benefit either. During the time of restructuring your society has become more open, and this is inspiring the staff members of our journal: we would like to become closer to our readers in the Soviet Union and, accordingly, to receive more rapid information on events in your laboratories. In this connection we are considering the question of establishing our own department in Moscow and the possibilities of printing NATURE in the Soviet Union. We are placing great hopes in cooperation with PRIRODA.

PRIRODA: Why with PRIRODA? We are, after all, so dissimilar!

J. Maddox: The fact that NATURE in Russian means "priroda" [nature] and, consequently, we are "namesakes" is, of course, not the primary thing, although it seems very symbolic. The main thing is that our audience for the most part consists of scientists. Our cooperation could take place in the most diverse forms—from direct contacts between staff members and the sharing of experience and information to the preparation of joint publications.

I would like by my activity as a scientific journalist to make what contribution I can to bringing scientists of East and West closer together. The speech of Mr. Gorbachev at the United Nations on 3 December of last year inspires the hope that the world will become different.

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Changes in Statutes of Latvian Academy of Sciences

18140310 Riga IZVESTIYA AKADEMII NAUK
LATVIYSKOY SSR in Russian No 6, Jun 89 pp 11-14

[Text] Several Most Important Amendments and Additions to the Charter of the Latvian SSR Academy of Sciences

(Adopted by the General Assembly of the Academy on 6 April 1989. Subject to Approval by the Latvian SSR Council of Ministers)

1. The Academy of Sciences of the Latvian Soviet Socialist Republic is the highest sovereign scientific organizations of the Latvian SSR, which unites the members of the Latvian SSR Academy of Sciences.

Scientific organizations and institutions, the work of which is financed from the budget of the republic and other sources, belong to the system of the Latvian SSR Academy of Sciences.

13. Full members (academicians), corresponding members, honorary members, and foreign members are the members of the Latvian SSR Academy of Sciences.

18. Upon the attainment by full members of the Latvian SSR Academy of Sciences of the age of 70 vacancies are opened for the election of new full members of the Latvian SSR Academy of Sciences.

32. The Latvian SSR Academy of Sciences informs the scientific community of the Latvian SSR about its activity by the invitation of leading scientists to its annual and specialized sessions and takes into account in its activity the recommendations of the scientific community.

34. Full members enjoy the right to vote in the General Assembly of the academy.

Corresponding members and honorary members of the Latvian SSR Academy of Sciences and executives of scientific institutions of the Academy of Sciences, who are not members of the Academy of Sciences, enjoy the right to vote, except for the election of new members of the academy and the election of the presidium of the academy, in the General Assembly of the academy.

In individual cases in accordance with the decision of the General Assembly the delegates elected by scientific collectives in accordance with the norms of representation, which are established by the General Assembly, also enjoy the right to vote in the General Assembly of the academy.

36. The president and vice presidents of the Latvian SSR Academy of Sciences are elected by the General Assembly of the academy from among the full members of the academy for a term of 5 years. They can be reelected for only one new term.

The president of the academy, the vice presidents of the academy, the chief scientific secretary of the presidium, and the academician secretaries of the departments cannot simultaneously hold the positions of directors of institutes or other scientific research institutions or organizations.

Members of the Latvian SSR Academy of Sciences can perform the duties of a member of the presidium of the Latvian SSR Academy of Sciences up to the age of 70.

45. The presidium of the Latvian SSR Academy of Sciences and its official staff conduct office work in Latvian.

48. The academician secretary of the department is elected by the general assembly of the department by secret ballot from among the members of the academy for 5 years, but is reelected for not more than the next 5 years, and is approved by the General Assembly of the academy.

56. The director of the institute of the Latvian SSR Academy of Sciences is elected by secret ballot by the scientific collective of this institute from among the leading scientists for a term of 5 years and is approved by the general assembly of the corresponding department of the academy.

62. The amendment of the Charter of the Latvian SSR Academy of Sciences is carried out in accordance with a decision of the General Assembly of the Latvian SSR Academy of Sciences, which has been adopted by a majority of not less than two-thirds of the votes of the full members and corresponding members of the academy and has been approved by the Latvian SSR Council of Ministers.

Several Most Important Amendments and Additions to the Statute on the Department of the the Latvian SSR Academy of Sciences

(Adopted by the General Assembly of the Academy on 6 April 1989)

3. The department of the Latvian SSR Academy of Sciences is the basic scientific and scientific organizational center, which represents at the Academy of Sciences scientists of one or several fields of science. The department unites institutes of the Academy of Sciences and other scientific institutions and enterprises of a related type.

4. The department of the Latvian SSR Academy of Sciences directs the development of basic research of the corresponding field of science in the republic and formulates proposals on the acceleration of scientific and technical progress and the socioeconomic and spiritual development of society.

The department submits its evaluations and proposals to the General Assembly and the presidium of the Latvian SSR Academy of Sciences.

The department reports on its work to the General Assembly and the presidium of the Latvian SSR Academy of Sciences.

6. For the fulfillment of its tasks the department:

- approves the basic assignments on the plans of research of the scientific institutions of the department, monitors the fulfillment of the work on state orders, the decrees of directive organs and superior organizations, and special-purpose financing, and organizes competitions of scientific themes;
- evaluates the basic research in the specialization of the department, which is being conducted at higher educational institutions and scientific institutions of other ministries and departments;
- annually considers the proposals of the scientific institutions of the department on questions of financing, including currency allocations, and submits its own proposals to the presidium of the academy;
- makes decisions on the payment of bonuses to the directors, deputy directors, scientific secretaries, and chief accountants of the scientific institutions that are a part of the department.

9. The full members and corresponding members of the Latvian SSR Academy of Sciences have the right to vote in the General Assembly of the department, to which they belong.

The director of the institute of the Academy of Sciences, if he is not a member of the academy, takes part in the general assembly of the corresponding department with the right to vote, with the exception of questions of the election of new members of the academy, when he enjoys a deliberative voice.

In individual cases in accordance with the decision of the general assembly of the department the delegates elected by scientific collectives in accordance with the norms of representation, which are established by the general assembly of the department, enjoy the right to vote.

17. The bureau of the department:

17.12. approves the deputy directors and scientific secretaries of institutes, the staff of the scientific councils for problems, committees, and commissions, which belong to the department; approves the staff of the editorial boards of the scientific journals of the department; submits the editors in chief of the scientific journals and the chairmen of the scientific councils for approval to the presidium of the Latvian SSR Academy of Sciences.

Several Most Important Amendments and Additions to the Model Charter of the Scientific Research Institute of the Latvian SSR Academy of Sciences

(Adopted by the General Assembly of the Academy on 6 April 1989)

8.11. Establishes contacts with foreign organizations, firms, and scientific centers, concludes with them contracts on cooperation, deliveries of specimens, instruments, and equipment, the transfer of technological developments and scientific and technical information.

24. The institute...

24.2. drafts and finally approves the annual plans of applied and exploratory scientific research work, in which the plan assignments and orders are taken into account; distributes, within the available amounts, financing in conformity with the plan of scientific research work;

24.5. draws up the drafts of plans of international scientific cooperation and the drafts of plans of the sending of scientists to foreign countries; in accordance with established procedure concludes agreements on scientific cooperation with foreign organizations; determines the candidates for travel abroad and invited foreign scientists; approves the programs and scientific assignments for the plans of foreign business trips; draws up the exit documents; hears the reports on the results of foreign scientific contacts....

25. The institute:

25.1. determines the outlays within the limits of the budget allocations and standards, which have been earmarked for the institute;

25.2. draws up, approves, and changes the estimates of the outlays on the maintenance of the management staff.

34. The management of the institute is carried out on the basis of the one-man management of the director of the institute with allowance made for the decisions of the Scientific Council with the broad participation of the workers in management.

35. The director of the institute heads the scientific research institute of the Latvian SSR Academy of Sciences.

The director of the institute is elected by the general assembly of the scientific collective of the institute on a competitive basis by secret ballot for 5 years. The candidate, who has received more than 50 percent of the votes, is considered elected. The scientific collective, the registered staff of which is approved by the scientific council of the institute, is authorized to hold elections when not less than two-thirds of the collective are present. Invited representatives of related scientific and higher educational institutions with a deliberative voice can participate in the discussion of the candidates.

The department of the Latvian SSR Academy of Sciences considers the candidate director, who has been elected by the scientific collective of the institute, and conducts a secret ballot on him. If the candidate, who was elected by the scientific collective of the institute, did not receive more than half of the votes in the

department, the scientific collective of the institute is ordered to hold repeat elections.

If after the runoff of the scientific collective its opinion is again not shared by the majority of members of the department, the presidium of the Latvian SSR Academy of Sciences appoints the candidate, who was elected by the scientific collective of the institute, acting director of the institute for a term of up to 2 years.

The director of the institute can hold this position for not more than two terms in succession up to the age of 65 (members of the Latvian SSR Academy of Sciences—up to the age of 70).

The scientific collective of the institute has the right by secret ballot by not less than a two-thirds majority to submit the proposal to relieve the director of the institution of his post ahead of time. The results of such a ballot are the basis for the making by the department of the academy of the decision on the organization of a new election of the director, but in case of the refusal of the department the presidium of the academy makes the decision on this question.

39. The Scientific Council of the institute is the organ that represents the scientific collective of the institute.

40. The size and structure of the Scientific Council are specified by the decision of the general assembly of the scientific collective.

41. The members of the Scientific Council are elected from among the leading scientists of the institute, except for the people who belong to the council by reason of their position (the director, the deputy directors for scientific work, the scientific secretary), by the assembly of the scientific collective of the institute by secret ballot for a term of up to 5 years.

42. The sections of the Scientific Council are elected by the corresponding scientific collective (Scientific Council) for a term of up to 5 years.

43. The Scientific Council by secret ballot by a majority of votes elects the chairman of the Scientific Council, the deputy chairman, and the secretary.

44. The Scientific Council of the institute:

44.1. specifies the strategy of the scientific research activity of the institute and the basic directions of the scientific production activity of its cost accounting subdivisions, makes decisions on all fundamental scientific, scientific and technical, and organizational problems, which arise during the activity of the institute, specifies the use of the financial, including currency, assets and material resources of the institute and its subdivisions;...

46. In case of differences between the Scientific Council and the director of the institute the decision on the question at issue is made by the general assembly of the

scientific collective of the institute or the bureau of the corresponding department of the Latvian SSR Academy of Sciences.

The Scientific Council has the right to express lack of confidence in the director of the institute and to submit this question for discussion by the general assembly of the scientific collective of the institute....

51. The head of the scientific research subdivision of the institute is elected for 5 years on a competitive basis by the Scientific Council of the institute from among all the candidates who have been considered by the scientific collective of the subdivision. If none of the candidates for this position was elected by the scientific council, the director of the institutes appoints an acting head of the subdivision for a term of not more than 2 years. The appointment to the positions of heads of scientific research subdivisions of members of the Latvian SSR Academy of Sciences is made for a 5-year term by the director of the institute without competition and election, but after the discussion of the report of the member of the Latvian SSR Academy of Sciences on the program of work of the subdivision and a secret ballot in the scientific council of the institute.

53. The head of the scientific research subdivision:

53.1. draws up drafts of the plans of scientific research work of the subdivision, distributes the available financial and physical assets and equipment within the limits of financing of themes, submits proposals on the change of salaries;...

The excerpts from the charters and statutes were prepared by Ya.Zh. Kristapson.

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Academician Discusses Changes in Statutes of Latvian Academy

18140316a Riga NAUKA I TEKHNIKA in Russian
No 7, Jul 89 pp 6-7

[Speech by Academician of the Latvian SSR Academy of Sciences Professor Yan Stradyn at the General Assembly of the Latvian SSR Academy of Sciences: "For Democracy at the Latvian SSR Academy of Sciences"; first two paragraphs are NAUKA I TEKHNIKA introduction]

[Text] In publishing the speech of the well-known Latvian chemist, historian of science, writer, and cultural studies specialist at the General Assembly of the Latvian SSR Academy of Sciences, we hope that it will be of great public interest.

From the editorial board: The amendments to the model charter of the Academy of Sciences and its institutes, which were adopted at the General Assembly of the Latvian SSR Academy of Sciences, were published in IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR (No 6, 1989).

One of the central questions of this general assembly is the democratization of the Academy of Sciences and the unleashing of the scientific and social activity of many, many scientific associates. We are adopting substantial amendments to the model charter of the Academy and its institutes. The attitude toward the charter at the academy is approximately the same as the attitude of the public at large to the Constitution about 2-3 years ago: no one had read this charter before; thus, it is an empty legal formality, but now what passions are seething, what polemics have developed—and all because the real prerequisites for its practical application have appeared.

We will not forget, however, that the stimulus for the discussion of the problem of changing the charter was provided by the collective of scientists of the Institute of Organic Synthesis, which in the spring of 1988 refused to accept the bureaucratic changes, which were recommended "from above," of the model charter of the institute after the pattern of the USSR Academy of Sciences.

Now both the commission for the drawing up of the charter of the chemical and biological department and the charter commission, which was named by the presidium of the Latvian SSR Academy of Sciences, are working actively—both here and there we carefully reviewed paragraph after paragraph, with allowance also made for the suggestions of the newly established Union of Scientists of Latvia. And in the new charter there are many new, positive features: it is declared that the Latvian SSR Academy of Sciences is a sovereign scientific institution and, therefore, the paragraphs concerning the fact that even in the election of its new members it should take as a guide the recommendations of the departments of the USSR Academy of Sciences, were crossed out; the idea that the entire scientific community of the republic should be involved in the announcement of vacancies for new members of the academy, is developed; an age qualification is established for academicians—70. In the institute charter it is stated unambiguously that the director of the institute is elected by the scientific collective, not by the department; the relations between the director and the scientific council—the representative organ of the collective—are regulated; it is stipulated how one should act in difficult, controversial situations of different kinds.

However, the new charter, undoubtedly, is also a palliative; our life in the time of restructuring is changing so rapidly that, most likely, the development of science in the country and the sovereignty of the republic will force us in a few years to revise the charter again. For it is not yet completely clear how science will function under the new conditions.

Fundamental questions—what is the Academy of Sciences, what is the institute, what should the relations between them be—are being placed on the agenda already today. Until now in academic life everything was regulated mainly "from the top down." Paraphrasing the

debate, which is so topical today, about the establishment of a federation of republics, at the academy the thesis "A strong center is strong republics," and not the thesis "Strong republics are a strong union," also dominated. Thus, for example, I would like there to prevail at the Institute of Organic Synthesis the point of view that the institute is not only an independent scientific institution (as is recorded—for the first time—in the new charter), but also a primary scientific organism, that a number of institutes constitute the academy, delegating a part of their powers to the general assembly and the presidium of the Academy of Sciences, not vice versa. In other words, it is necessary to build the academy from the bottom up as an association of scientific collectives, while also including experimental plants in this association. This would correspond more to the spirit of the times and to the new conditions of economic management.

The question, of course, is debatable, but already today several alternative models of the future Academy of Sciences should be examined theoretically. The Union of Scientists of Latvia is organizing the conference "Latvian Science—Problems and Prospects." Among the themes of the conference are the organization and financing of the basic sciences at our academy and the higher educational institutions of Latvia, the problems of cooperation, and, perhaps, a new model of republic science in general. I do not know on what we will settle, whether we will change anything or will recognize the present state of affairs as optimal, but one thing is clear—the conclusions should be the result of a careful analysis, with allowance made for the positions and opinions of all our scientists.

How is one to combine within the Academy of Sciences elitism and democracy? The charter of the USSR Academy of Sciences was made the basis of our charter, including the new one, while it, in turn, goes back in its roots into remote history right to the times of the absolutism of Peter I (or Catherine I). In the structure of the Academy of Sciences, in essence, the corporative principle, exactly the same cooptation, in accordance with which at one time the Riga magistrate was elected, dominates. Other academies of sciences of Europe, of course, also have a similar charter. On the one hand, this allows the Academy of Sciences not to accept into its circle people who do not have scientific services, but, on the other, the same procedure made it possible to "slate" D. Mendeleev and many other scientists of the highest class, who for some reasons or others seemed undesirable to the given complement of members of the academy—K. Timiryazev writes eloquently about this in his book "Nauka i demokratiya" [Science and Democracy] (1920). I cannot, therefore, agree with Academician V. Samson, who states in his annual report that the Academy of Sciences is based on age-old democratic traditions—in essence, these are sooner elitist corporative traditions, although, perhaps, in "large-scale science" they are precisely suitable to the occasion. These traditions, incidentally, in many respects protected the USSR Academy of Sciences from voluntarism

during the years of Stalin, Khrushchev, and Brezhnev and the orchestrated "expression of the will of the masses" and made it possible, by the way, to retain Andrey Dmitriyevich Sakharov in the membership of the academy.

But it is impossible not to take into account that under our conditions the Academy of Sciences by its nature is dual. This is not only an amalgamation of leading, "elite" scientists, but also a large association of scientific institutions, at which thousands of associates work. Specifically, in 1988 there were 55 members (27 full members and 28 corresponding members) in the Latvian SSR Academy of Sciences. Now, after the new election, this number has increased to 65. At the same time 1,883 scientific associates (including 131 doctors of sciences and 986 candidates of sciences) work within the walls of the academy. In essence, the majority of the scientific collective of the academy has the right to vote only at the level of its institutes, it takes almost no part in the solution of general, fundamental problems for the academy. Going over in my mind the general assemblies of the Academy of Sciences in recent decades, I do not recall a single if only senior scientific associate speaking from this rostrum, but perhaps they have nothing to say!

In my opinion, in order to arouse scientific and social activity in the settlement of fundamental questions, it is necessary to give the right to vote at the general assembly of the Academy of Sciences not only to academicians, as is stipulated by the present charter, but also to corresponding members and the executives of scientific institutions, who are not members of the academy, as well as to delegates from the scientific collectives—their authorized representatives (either to two people each from every institute, as is proposed by the chemical and biological department, or to three people each, as the scientific council of the Institute of Organic Synthesis recommends). Of course, the titled members of the academy, who work at institutes, in many cases could also represent their collectives, but in any case they always represent themselves, and it would be incorrect to tie them down with obligations that prevent them at times from expressing their personal point of view. Moreover, our proposal retains for members of the academy a "controlling block" of votes—65 "academic" votes against 30-50 "institutional" votes; it is also unquestionable that in the election of new members or the presidium of the academy only its members themselves, as before, will participate. But in the discussion of the scientific directions of the work of the academy and fundamental changes of its structure, in the founding of new scientific institutes, and in matters of reorganization it is also necessary to let the proxies of the scientific collectives speak. And this is certainly the case, when it is a question of the socially significant phenomena and processes in Latvia and throughout the Soviet Union.

Then, perhaps, the chief scientific secretary of our academy will also not have to admit in a self-critical manner that during the hot summer and fall of last year the Academy of Sciences and its scientists and institutes

in many cases, unfortunately, lagged behind the processes occurring in Latvia. And unlike the academies of the neighboring republics we gave up almost entirely to others the initiative of bringing up, elaborating, and discussing pressing urgent problems. In this connection the Academy of Sciences was honored with critical remarks on the part of the Latvian CP Central Committee. Many reproaches, at times even incorrect ones, were also addressed to it at the constituent congress of the Union of Scientists of Latvia. Should one take offense at the form of critical statements, since the standards of debates in the country as a whole are low? But it is impossible not to take criticism into account.

What is more, I believe that if the Academy of Sciences actually intends to be the highest scientific center of the republic, as is recorded in the charter of the Academy of Sciences, in the discussion of some problems at the general assembly of the Academy of Sciences the representatives of Latvian higher educational institutions and nonacademic scientific institutions should also be given a say.

Today the membership of the Latvian SSR Academy of Sciences has been reinforced by new academicians and corresponding members, in many cases from Latvian higher educational institutions. These are respected, distinguished scientists, and we can only be glad of such a reinforcement. Another fact arouses regret—Yuris Zakis, Kurt Shvarts, and Yuriy Urzhumtsev did not become academicians, in connection with which in this election the academy lost two vacancies for full members of the Physical and Technical Sciences Department. In my opinion, motives, which have no bearing on science, played their role in this "mess up." Professor Yanis Freymanis, Professor Ivars Knets, people's poet Imants Ziyedonis, and a large number of other worthy people, whose candidacies were discussed at one stage or another of the nomination or election, remain outside the walls of the Academy of Sciences. The work and public activity of these people for the good of restructuring give them the right to be in the academy. This year Gunars Andrushaytis and Peteris Tsimdinsh are defending doctoral dissertations in ecology. With respect to the index of citation of his scientific works physicist Edgars Silinsh is one of the leaders among scientists of Latvia. Therefore, I would like to propose to organize the next election of members of the academy not in 3 years, but already next year, in the hope that the Council of Ministers will allocate the necessary assets for these needs, especially as they do not exceed the pay of one brigade of loaders.

And I would like to mention another thing—we also practically did not use the paragraphs, which were included in the former charter, on the election of honorary members of the Academy of Sciences and the awarding of the degree of honorary doctor of sciences. Thus far there has been only one such precedent—in 1946 astronomer and metrologist Fritsis Blumbakh, an associate of D.I. Mendeleyev, was elected an honorary member of the Academy of Sciences. It seems to me that the Academy of Sciences could have given such an honor

to more than one person who has services to science and the homeland. I propose, therefore, to discuss at the next general assembly such candidates as Aleksandr Nikonov—president of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, a prominent specialist in agricultural economics, former secretary of the Latvian CP Central Committee and Latvian SSR Minister of Agriculture; Paul Ariste—a full member of the Estonian SSR Academy of Sciences, who has done much for the development of linguistics in Latvia; Vyacheslav Ivanov—a prominent Moscow Baltic studies specialist, encyclopedist, and cultural studies specialist; Yanis Peters—a poet, chairman of the Council for Culture of the Creative Unions of Latvia. It would be possible to continue the list of names. I also propose to award the academic degree of honorary doctor (Doctor honoris causa) to Academician Vilis Samson, an authoritative scientist in Latvia (for his contribution to the study of the creativity of people's poet Yan Raynis and the evaluation of the cultural legacy of the Latvian people), and to historian Teodors Zeyds (for research on the history of feudal Riga and the publication of the heritage of Y.Kh. Brottses). The conferring of these titles is not a formality, it would increase the prestige of our Academy of Sciences, would rid it of a certain tinge of provincialism, would include it in the context of all-union and world science, as well as would link it more deeply with the progressive processes that are occurring in the social life of Latvia.

Only the unleashing of initiative "from above" and "from below," greater glasnost, and new ideas of the building of the future Latvia can give our academy "a second wind" and raise it, whether or not we want to admit this, shaken prestige in the republic, especially among young people and at higher educational institutions.

My remarks do not have to the slightest degree the goal to hurt the reputation of the Academy of Sciences and its leadership. My entire scientific life is connected with the academy, I have worked 33 years within its walls, having exceeded, so to speak, the 25-year term of "Nikolayevskiy soldier's service."

I have always believed and as before am convinced that the basic sciences in Latvia are most strongly developed at the Academy of Sciences; it is necessary to convince the public that under any, even the new, conditions the basic sciences are of great importance for Latvia, since there cannot be a civilized state without developed science that enjoys recognition throughout the world.

The democratization of science in itself does not provide anything. In science not the majority of votes, but professionalism, quality, and ideas, not assemblies, but painstaking labor in laboratories, libraries, and archives are decisive. But democratization can bring new forces to life, can overcome stagnation wherever it has had time to take root, and can ensure an influx of young scientists.

The Academy of Sciences will gain new momentum, only if it follows the slogan of Raynis: "In transformation lies the guarantee of existence."

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Research Chief at Latvian State University Interviewed

18140316b Riga NAUKA I TEKHNIKA in Russian
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[Interview with Corresponding Member of the Latvian SSR Academy of Sciences Rikhard Yazepovich Kondratovich, doctor of biological sciences, professor, prorector for scientific work of the Latvian State University imeni P. Stuchka, by O. Sarma under the rubric "Scientists Close Up": "When Work Is a Passion"; date not given; first paragraph is NAUKA I TEKHNIKA introduction]

[Text] This conversation took place in the central building of the Latvian State University imeni P. Stuchka, in a room with the plate "Prorector." I addressed to the prorector for scientific work, Doctor of Biological Sciences Professor Rikhard Yazepovich Kondratovich—one of the youngest corresponding members of the Latvian SSR Academy of Sciences—a question about his present work.

NAUKA I TEKHNIKA: It is possible to find in the appropriate literature the fact that you were born in 1932 in Asunenskaya Volost and other biographic information. But tell me what you have already succeeded in doing in this office, since you became prorector at your higher educational institutions.

R. Ya. Kondratovich: This is, indeed, "my" higher educational institution, since I have been connected with the university since 1950, when I began to study here. I completed my studies in 1955.

In this office, honestly speaking, I am still quite a novice as compared with my colleagues: I have been here since 1 February of last year. At one time, when they were electing the rector, I was a rival of Yuris Zakis. There were three of us at the "finish line." After becoming rector, Professor Zakis hired me for the position previously held by him. While I was a student, I was constantly in contact with science, and this work was never foreign to me. The start of my activity in this place is as if connected with restructuring: one of our tasks is to bring university science closer to the requirements of the times.

NAUKA I TEKHNIKA: Did you have your own store of ideas or were you, rather, disposed to wait for suggestions of the new leadership?

R. Ya. Kondratovich: When taking a new chair, it is possible to act in different ways: either reject everything old, tear it completely to pieces....

NAUKA I TEKHNIKA: Such radical actions were hardly necessary.

R. Ya. Kondratovich: My principle is as follows: to continue what was begun by Rector Zakis and at the same time intensify the restructuring of the leadership of science.

Scientific research centers—the Computer Center, the Institute of Solid-State Physics, a large number of small problem laboratories: spectroscopy and the physiology of the development of plants, the geography sector, an observatory...existed under the university. We came to the conclusion that from these small subdivisions it is necessary to establish a scientific research section with the status of a scientific institution. We obtained the first category, the opportunity appeared to pay associates a significantly larger wage.

We discussed together what prospects the 15 directions of our scientific work might have. For the coordination of each of these directions we established a problem council with the participation of the best specialists of the field—not only of the university, but also of the republic Academy of Sciences. The task of the council is to specify the direction of scientific work in one field or another, to make an examination of new themes, to evaluate dissertations, to nominate scientists for doctoral studies, and so forth.

NAUKA I TEKHNIKA: By what were you guided when selecting the directions: state plans, the urgency of the problem, or public opinion—what the national economy has more need for?

R. Ya. Kondratovich: First, it was necessary to evaluate our scientific potential and the traditions, in which we had been successful. Then we checked with the state orders in the field of science and individual sectors and subject to this specified the basic scientific directions.

There is another thing that I would like to note. We became the leading higher educational institution of the republic, which, for example, has its own doctoral studies. This is having a favorable effect on the training of specialists. We are training specialists for ourselves, Daugavpils, and Liyepaya and, in the social sciences, also for Riga Polytechnical Institute. We have been permitted to confer ourselves the academic titles of docent or professor.

NAUKA I TEKHNIKA: And do you not have a sense of isolation from science in this continuous flow of matters?

R. Ya. Kondratovich: Although, in fact, this is purely an administrative job, all the same I believe that I will never give up science. I am trying to devote 1 day a week to science and to get to my base.

NAUKA I TEKHNIKA: More precisely: to the Babite Experimental Selection Nursery of Rhododendrons.

R. Ya. Kondratovich: Yes. Since 1975, when I left the post of secretary of the party organization of the university, I have succeeded in realizing my age-old dream—to establish an experimental selection nursery in Babite.

NAUKA I TEKHNIKA: How is your steadfastness with respect to a single crop—rhododendrons—explained?

R. Ya. Kondratovich: At one time I said in jest: this is a lazy flower, that is why I took it in hand. When I graduated from the university, they threw me like a puppy into cold water—they appointed me director of the university Botanical Garden. I worked there 10 years. During my student years I engaged in Komsomol and party work and in general actively showed my worth in public life, but here I had to think about science. By specialty I am a plant physiologist. I could not set to work on intensive crops, inasmuch as I did not have the time to devote all day, from morning to night, to them. I looked closely at rhododendrons: a beautiful shrub, which is rarely cultivated and is very popular abroad. Five bushes remained in the garden from prewar times, in Yurmala at several dachas these plants were also encountered. We attempted to enlarge the assortment and studied the literature. They began to send us seeds from all corners of the world. In 1964, when a collection of 80 species had been established, I defended my candidate dissertation. The material was massive, the most in the Soviet Union. Then we engaged in the study of the biochemistry, physiology, and hardness of this plant and attempted to find an answer to why some early species produce seeds, while others do not.... There were many problems. Materials for a doctoral dissertation accumulated. Later we began to collect species, interbred them, and obtained new ones. Now we already have 11 inventor's certificates. Six new strains of rhododendron Sims have been turned over for checking. We also have several hundred hybrids, which are cultivated in open ground. Methods of selection work have been developed. In recent years we have had simply no time for everything: we are engaging only in the reproduction of material, but cannot put it in order for state strain testing. But we will do this yet.

A program, which is considered modern and on which we are also working, is biotechnology, the propagation of plants with tissue cultures. With cuttings or by means of a graft from 1 bush it is possible to obtain, for example, up to 20 nursery plants. The meristem system makes it possible in a year to obtain 10,000-20,000 nursery plants. Datse Gertnere, the head of a laboratory, is dealing with this. Here, just as everywhere in our country, there are difficulties with chemicals. There are no growth regulators: we cannot get imported ones, domestic ones are of low quality. We are cooperating with the Institute of Microbiology of the Latvian SSR Academy of Sciences and thus are partially solving this problem.

NAUKA I TEKHNIKA: Is there reason to believe that Latvian specialists in rhododendrons are in demand not only in our country. Surely you have some broader contacts?

R. Ya. Kondratovich: Against the background of foreign know-how we also look rather good. Our hybrids are not always as luxurious as, for example, those cultivated in England, but they are hardy. Now we are faced with the task to develop strains, which have been adapted to our climatic zone, so that it would not be necessary to buy them abroad. We have good contacts with Czechoslovak, Bulgarian, and Polish colleagues and with the German Democratic Republic. I was a participant in three international conferences on rhododendrons. At the last one, last year, I read a paper on the hardiness of rhododendrons. Contact has also been established with Americans, and they contributed to my joining of the American Rhododendron Society. I regularly receive literature, we exchange seeds.

We also have common interests with Scandinavians. This year they are buying 1,000 rhododendrons from us. Since April we have been allowed direct contacts, but at the same time a large number of restrictions exist. I had a telephone conversation with the representative of a firm; they told me: "Pardon me, but I am now afraid to buy these 1,000 nursery plants, for the present trade with your country has not been stabilized. If I make a promise to clients, one way or another I will receive these nursery plants, but they will remain a month at your port, and then everything will have come to nothing—losses are inevitable both for you and for us. We will wait until everything gets settled." But, at any rate, the firm is not canceling its order. When there is currency, we will be able to buy the scarce chemicals. Therefore, I believe that at present Babite is the most successful of the university experimental bases. But everyone wants to see his idea implemented, not buried in documents.

NAUKA I TEKHNIKA: At the beginning we came to the understanding that from the standpoint of the chronology of events our conversation would not be sequential; therefore, I want to return again to the past and to ask what you dealt with during your student years.

R. Ya. Kondratovich: I grew up in a rural area, in the family of a forest guard, and decided to become a soil scientist. But when I arrived at the faculty, it turned out that there was no enrollment that year in the department of social science. Then I settled on plant physiology. With what did I deal? I worked in the student scientific society, moreover, sports appealed to me—I was on the university team in various sports and had the time both to dance and to sing in the ensemble. In short, student life was diverse. Therefore, when I began to work at the Botanical Garden, I easily made

contact with people. After defending my dissertation they promoted me to the position of dean of the faculty, but left me at the garden as a scientific supervisor. I worked at the faculty 5 years, and at that time they elected me secretary of the party committee of the Latvian State University. This was a crazy time: I had to combine the duties of docent of the faculty with public work. I began to feel that I was starting to fall behind in science. In the end I declared a categorical "no" and after 6 years of party work remained only docent of the faculty. Here I literally broke loose—all the time is mine. Over several years I wrote three books, did practical studies at Humboldt University, and there, in fact, wrote a monograph on rhododendrons, in which I generalized the results of all 25 years of work. At the same time I wrote several popular pamphlets. I defended the monograph as my doctoral dissertation. At that time I was also elected professor.

NAUKA I TEKHNIKA: On the list of your awards there is the republic State Prize. For what did you receive it?

R. Ya. Kondratovich: Here it is necessary to make a small digression. At one time, when introduction was completed, we showed our works in Moscow, at the Exhibition of National Economic Achievements, and I received three gold medals: in 1965 for the introduction and practical adoption of rhododendrons, in 1977 for the development of industrial methods of their propagation, and in 1981 for new strains. The 1985 State Prize was awarded for all the work as a whole. In postwar times this is the first republic State Prize in decorative plant growing.

NAUKA I TEKHNIKA: You said that at some time you felt as if tethered. Has it not turned out that today this tether has become stronger? Or does time all the same remain for something else?

R. Ya. Kondratovich: The subject of research is so interesting that, in fact, work for me coincides with what is called a hobby. It is not boring: the family of rhododendrons is so diverse, the most different chances, successes and failures, are possible here. At times, it seems, something fabulous should result, but some nonsense results. But still a well-known path has been covered: I have my own strains, a nursery.... It is necessary to continue the work.

By happy coincidence my daughter and son have followed, as they say, in my footsteps. Both have graduated from the biology faculty and are working with rhododendrons. A basis exists, and they can continue my cause. Such direct continuity brings me satisfaction.

NAUKA I TEKHNIKA: Thank you for finding time for the interview.

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**USSR Medical Sciences Academy Examines
LiSSR Progress in Medical Research**

*18140293 Moscow MEDITSINSKAYA GAZETA in
Russian 18 May 89 p 1*

[Article under the rubric "Official Department": "In the Presidium of the USSR Academy of Medical Sciences"; first paragraph is MEDITSINSKAYA GAZETA introduction]

[Text] The Presidium of the USSR Academy of Medical Sciences examined the question of the progress of the fulfillment of the Comprehensive Program of the Development of Scientific Research in Medicine in the Lithuanian SSR for 1987-2000.

In all 13 institutes of the USSR Academy of Medical Sciences, 2 institutes of the USSR Ministry of Health, 4 institutes of the Lithuanian SSR Academy of Sciences, 7 institutes of the republic Ministry of Health, and Vilnius State University are participating in the fulfillment of the assignments of the program. Cooperation among the scientific institutions is being carried out in 14 directions.

As was noted in the presidium, the 2 years of joint work and the joining of forces yielded an impact in the solution of a number of specific problems and important scientific and practical results were obtained.

Thus, a data bank was formed under the Lithuanian SSR Cancer Register. Special electrodes and an electrocardio-stimulator for the percutaneous stimulation of the heart were developed. Methods of noninvasive electrophysiological examination under the conditions of a polyclinic were proposed. Two new endocrine drugs and one anti-tumor drug, as well as two types of kits for the radioimmunological determination of somatotropin were developed.

A system of epidemiological inspection for viral hepatitis is being introduced on the territory of the republic. A retrospective analysis of the number of cases of viral hepatitis type A was made. As a result of specific prophylactic measures, with allowance made for the water and food factors of the transmission of the infection, it was possible to reduce significantly the number of cases of hepatitis A.

Methods for laser operations on the conduction paths of the heart and a laser unit for the irradiation of biologically active points of man for the purpose of increasing the fitness of workers of industrial enterprises for work were developed.

At the same time certain difficulties exist in the coordination of research on the program, in connection with which it is necessary to hold working conferences of its participants.

However, the greatest difficulties in the fulfillment of the program are arising in connection with the termination of the financing of several jobs and the lack of currency

allocations for the purchase of reagents and equipment. This can lead to the upsetting of a number of assignments.

The Presidium of the USSR Academy of Medical Sciences resolved to petition the Lithuanian SSR Council of Ministers for the settlement of the question of the further financing of the program, to step up the activity of the Coordinating Council for the program, and to examine annually at its working conferences the totals with the analysis of the results of completed research and the specific proposals on the use of the obtained results in the practice of health care.

Report on AzSSR Academy of Sciences Annual Meeting

*18140308 Baku BAKINSKIY RABOCHIY in Russian
4 Jul 89 p 3*

[Article (AZERINFORM): "Science Is a Key Component of Restructuring. The Annual General Assembly of the Azerbaijan SSR Academy of Sciences"]

[Text] During the period of modernization, which is occurring in all spheres of society, the time has come for Azerbaijan science to pose qualitatively new, fundamental organizational questions, which are closely linked with the socioeconomic development of the republic. Here basic research and work, which is connected with the practical tasks that face the economy of Azerbaijan and the spiritual sphere, should be harmoniously combined. These ideas determined the direction of the discussion at the session of the annual general assembly of the Azerbaijan SSR Academy of Sciences. The results of the work during the past year and the prospects of the further development of science in the republic were discussed at it.

The problems of increasing the effectiveness of research and the tasks on boosting the practical return of scientific work were raised in the statements of President of the Azerbaijan SSR Academy of Sciences E.Yu. Salayev, Vice President N.A. Guliyev, Acting Vice President U.K. Alekperov, Acting Academician Secretaries A.M. Aslanov and B.A. Nabiyeu, and Acting Chief Scientific Secretary A.A. Nadirov. Under the conditions of restructuring, they said, responsible demands, on the fulfillment of which the transition of society to a new stage of scientific and technical progress depends to a significant degree, are being advanced for science.

The statement of Academician M.I. Aliyev, who opened the discussion, was fully of deep anxiety about the prospects of the development of basic science. The training of the young scientific generation, he said, is causing particular alarm. Academicians M.A. Dalin, Z.M. Bunyatov, I.D. Mustafayev, E.Sh. Shikhalibeyli, M.A. Musayev, G.B. Abdullayev, and D.A. Aliyev and Corresponding Members of the Azerbaijan SSR Academy of Sciences Z.I. Budagova, T.S. Veliyev, and M.A. Ismaylov spoke about the need to increase the

contribution of Azerbaijan science to the cause of restructuring, to overcome the lag allowed by it, and to regain the lost positions.

Last year, it was noted at the assembly, a number of jobs of great importance were completed. The scientific institutions of the republic Academy of Sciences were represented in practically all state programs of the conducting of basic research.

The achieved gains provide grounds to assert that the available potential of Azerbaijan science is capable of giving the socioeconomic and spiritual development of the republic a strong push. The scientists of the republic, the speakers said, are well aware that without reliance on science, and first of all academic science, it is impossible to give an objective prediction of the development of the republic and to substantiate its prospects.

At the same time the unwieldy mechanism and excessive centralization of the management of science and the weak applied orientation of the research being conducted do not make it possible to undertake the accomplishment of this task with complete efficiency. Such a state of affairs cannot satisfy to any extent either society or scientists of the republic. It is necessary to restore that prestige of Azerbaijan science, when it enjoyed authority in many sectors and had its own priority directions of research.

Under the conditions of the preparation for the change-over of the republic to self-management and self-financing particular tasks are being posed for economic science, the efforts of which should be concentrated on the questions of developing the optimum socioeconomic infrastructure of the national economy and the search for the optimum means of implementing radical economic reform. At the same time the effective cooperation of the Institute of Economics of the Academy of Sciences with the republic State Planning Committee, which, in particular, is presently formulating the concept of the socioeconomic development of the republic to 2005, has not yet been organized. But the practice of such elaborations requires the scientific argumentation of every item and every point of the indicated concept.

At the recently held Azerbaijan CP Central Committee Plenum on questions of party agrarian policy serious tasks on boosting agricultural production in the republic were posed for scientists. Thus far the contribution of soil scientists and agrochemists to this work is entirely inadequate. Satisfactory results have not been obtained in the solution of the problems of developing highly productive breeds of animals and new strains of agricultural crops.

This is not the first year, it was noted at the assembly, that the questions of the necessity of strengthening the technical orientation in the work of academic institutes and increasing their role in and responsibility for the development of the theoretical bases of fundamentally new types of equipment and technology have been raised. However, thus far positive changes are not being

perceived in the activity of the Academy of Sciences in this direction. Inadequate attention is being devoted to the scientific support of such a key direction of scientific and technical progress as machine building. The serious lag of academic science in such science-intensive sectors as the electronization and integrated automation of production, instrument making, computer and micro-processor technology, information science, and the development of the element base must also be stated. The low level of equipment and production technology and the inadequate pace of the acceleration of scientific and technical progress in many respect are explained by these factors.

As before, the contribution of the Academy of Sciences to the production of the social product in the republic is extremely small, there have been no changes in the introduction of scientific research in practice. The leading role of the Academy of Sciences in the implementation of the program of the computerization of the republic is also not visible. Suffice it to say that there is neither a theme nor a scientific subdivision at the institutes of philosophy and law, cybernetics, and mathematics and mechanics, which deals with the problems of the informatization of society. The large-scale program of the integration of science with production within republic interbranch scientific technical complexes is being poorly fulfilled.

In the republic child mortality is high, an adverse situation has formed in the matter of protecting mothers and children. The most active participation of academic institutions is necessary in the solution of these problems. For integrated research in the field of medical science is one of the most important directions of the republic Health Program, which is called upon to solve problems of the development of the social sphere.

The health of people is inseparably connected with the state of the environment, which in many industrial centers is in a state of crisis. At the same time at the Academy of Sciences there is no specialized subdivision, which is oriented exclusively toward problems of ecology. The research in this area is being conducted in an unsystematic and unintegrated manner, moreover, in scientific surroundings they are dealing more with the statement of problems than with the development of urgently needed forecasting and ecological models of both individual regions of the republic and its water and air basin.

Restructuring has given rise to new socioeconomic changes and many phenomena, which it is difficult to appraise unequivocally. It is impossible to manage without the serious scientific interpretation of everything happening by social scientists and their forecasting of occurring processes. The model "the social conflict," which was developed in the republic, is reassuring in this respect.

Historians are doing much. However, "blanks" and undeservedly forgotten names, periods, and events still

gape and disturb. Historians in cooperation with philosophers and economists need to restore the complete truth about all periods and to reevaluate much all over again. This would also play a positive role in the improvement of social psychology.

At the session the decree on the restoration to G.N. Guseynov of the title of academician of the Azerbaijan SSR Academy of Sciences was adopted.

The report on the activity of the Azerbaijan SSR Academy of Sciences during 1988 was approved.

The election of full members (academicians) and corresponding members to the Azerbaijan SSR Academy of Sciences was held.

Secretary of the Azerbaijan CP Central Committee R.Ya. Zeynalov spoke at the session.

The Election to the Azerbaijan SSR Academy of Sciences

The annual general assembly of the Azerbaijan SSR Academy of Sciences was held on 30 June 1989.

The election of full members (academicians) and corresponding members of the republic academy was held at the assembly.

There were elected full members of the Azerbaijan SSR Academy of Sciences by specialties:

mathematics—Mirabbas Geogdzha ogly Gasymov; R. Ya. Kondratovich
physics—Magomed Gabibulla ogly Shakhtakhtinskiy
information science, computer technology, automation—Tofik Mamedovich Aliyev;
chemistry—Sakhib Museib ogly Aliyev, Bagadur Kasumovich Zeynalov, Musa Ismail ogly Rustamov;
geology—Akif Aga-Mekhti ogly Ali-zade, Subkhi Gashum ogly Salayev;
the working of petroleum and gas deposits—Kurban Nizameddin ogly Dzhallilov;
geography—Budag Abdulali ogly Budagov;
the physiology of man and animals—Shamkhal Kerim ogly Tagiyev;
medicine—Beyukkishi Aga ogly Agayev, Ragim Nuramed ogly Ragimov;
genetics—Urkhan Kyazim ogly Alekperov;
botany—Vagid Dzhahal ogly Gadzhiyev;
history—Tofik Kasum ogly Kocharli;
philosophy—Aslan Mamed ogly Aslanov, Afrand Fridunovich Dashdamirov;
economics—Asaf Abbas-Kuli ogly Nadirov, Ziyad Ali-abbas ogly Samed-zade;
philology—Bekir Akhmed ogly Nabiyeu, Kyamal Abdulla Shaig ogly Talybzade.

There were elected corresponding members of the Azerbaijan SSR Academy of Sciences by specialties:
mathematics—Akif Dzhafer ogly Gadzhiyev, Mais Gabib ogly Dzhaferov;
physics—Tayar Dzhumshud ogly Dzhaferov, Rufat Mir-Asadulla ogly Mir-Kasimov;

machine building—Nizami Mamed ogly Suleymanov;
mechanics, control processes—Ramiz Seyfulla ogly Gurbanov;
information science, computer technology, automation—Rafik Aziz ogly Aliyev;
scientific instrument making—Arif Mir-Dzhahal ogly Pashayev;
petrochemistry and petroleum refining—Mageram Ali ogly Mamedyarov;
high molecular compounds—Nadir Mir-Ibragim ogly Seidov;
chemical kinetics and catalysis—Tofik Gasan ogly Alkhazov, Oleg Ayazovich Narimanbekov;
physical chemistry—Tofik Murtuza ogly Nagiyev;
the theoretical principles of chemical technology—Agadadash Makhmud ogly Aliyev;
inorganic chemistry—Telman Khudam ogly Kurbanov;
the working of petroleum and gas deposits—Arif Mekhti ogly Kuliyeu, Faik Gadzhi Murad ogly Orudzhaliyev;
geophysics, geochemistry—Vasif Mamed Aga ogly Babazade, Iskender Sadykhovich Dzhaferov;
stratigraphy and paleogeography—Aliashraf Veysal ogly Mamedov;
soil science and agrochemistry—Mamedtagi Ibragim ogly Dzhaferov;
medicine—Ismail Teymur ogly Abasov, Yagub Dzhafer ogly Mamedov;
history—Savar Riza ogly Aslanov;
archeology and ethnography—Teymur Amiraslan ogly Buniyatov;
philosophy—Fuad Feyzulla ogly Kasim-zade, Maksad Magomedali ogly Sattarov;
history and theory of political legal doctrines—Maksuma Fazil kyzy Melikova;
economics—Agaslim Kerim ogly Aleskerov, Abdul-Gafur Aminulla ogly Zargarov;
literary criticism—Aliyar Kurbanali ogly Safarli;
linguistics—Zemfira Nadirovna Verdiyeva;
architecture—Shamil Seyfulla ogly Fatullayev;
art criticism—Rasim Samed ogly Efendiyeu.

[Signed] The Presidium of the Azerbaijan SSR Academy of Sciences.

Self-Accountability at Turkmen Scientific Research Institute

18140309 Ashkhabad TURKMENSKAYA ISKRA in Russian 1 Jul 89 p 2

[Article by Ch. Paytykov, director of the Turkmen Scientific Research Geological Prospecting Institute of the Turkmengeologiya Production Association, and S. Gogol, scientific secretary, under the rubric "Science": "The First Steps of Cost Accounting"; first paragraph is TURKMENSKAYA ISKRA introduction]

[Text] The Turkmen Scientific Research Geological Prospecting Institute of the Turkmengeologiya Production Association was one of the first in the republic in

1988 to change over to full cost accounting and self-financing. The experimental phase of work in accordance with the second model of cost accounting is over. What did it show, what are the first results like?

The changeover to cost accounting dictated the necessity of the radical change of the entire existing system of economic and structural interrelations at the institute. The basic principle: how much you earn is how much you will receive, took effect. Every kopeck saved on expenditures develops into full-weight rubles of the cost accounting income of the collective. It is no secret to anyone that the absence in science of deductions for the amortization of fixed capital contributed to its excessive accumulation. This also fully applied to our institute, where production equipment, including uninstalled equipment, accumulated for years. The implementation of organizational measures on the sale and transfer of the surpluses of productive capital made it possible to reduce its average annual value from 5.2 million rubles to 2.2 million rubles.

The cumbersome structure of the institute was done away with; the experimental methods expedition belonging to it was eliminated. Unprofitable subdivisions were transferred to interested organizations. Subdivisions, scientific research departments, and sectors were consolidated by combining subdivisions with similar themes of work, new ones were established in promising directions: the economics and planning of geological prospecting, drilling equipment and technology. The total number of departments was preserved with the increase of the amounts of work by two to threefold.

In connection with the changeover of the institute to cost accounting the certification of staff members was carried out. A central certification commission and sectorial certification commissions, which performed this work in two stages, were established: first they certified the staff members of the scientific research subdivisions, then the personnel of the eliminated expedition for the purpose of transferring the most skilled ones of them to the scientific section. The election of the heads of departments in the collectives preceded the conducting of certification. Unfortunately, certification was conducted during the initial period of the changeover to cost accounting, when the cost accounting standards and manning tables had not been completely arranged. Therefore, it did not make radical changes in the placement of personnel, although positive results were obtained: a large number of specialists were transferred to new positions, both with a promotion and with a demotion, several specialists of the nongeological type were relieved of the positions they held.

As a whole the reorganization of the structure of the institute and certification made it possible to reduce the number of staff members from 616 to 470 and the administrative and management personnel by 28 percent.

The implemented organizational measures made it possible to increase the salaries of staff members of the institute by 25 percent. In spite of this, the wage actually paid in 1988 to staff members of the institute is 10 percent less than the analogous 1987 data.

The changeover of the institute to the economic contractual system of work strengthened significantly the contact of science with production. The system of introducing scientific developments was simplified. Production organizations, especially those which have been converted to cost accounting, now are themselves interested in the introduction of innovations that yield an economic gain. Previously it was rarely possible to encounter production workers within the walls of the institute. Now they constantly go to the management, to the scientific council, of which they are now members, and to structural subdivisions. Here is the result: the volume of orders for the development of scientific and technical products has increased. Before the changeover to cost accounting the annual amount of scientific research work of the institute was 700,000-900,000 rubles, of which state budget allocations constituted from 80 to 100 percent. In 1988 the volume of scientific and technical products, work, and services increased sharply to 2.7 million rubles, while this year it has increased to 2.8 million rubles, that is, by more than threefold. The share of state budget allocations has decreased to 22 percent.

The practical efficiency of work increased significantly. The economic impact from the introduction of the recommendations, which were formulated in 1988, on the directions of geological prospecting, equipment, and technologies for the first time came to 3.8 million rubles, including 1.6 million rubles in the form of the actual profit at the works. For comparison let us note that in 1987 these indicators came respectively to 1.6 million rubles and 600,000 rubles. The economic effectiveness of individual developments amounted to 7-9 rubles per ruble of expenditures.

But along with the positive results cost accounting also exposed sore points. One of them is the rational ratio of promising scientific research developments and the fulfillment of contracts, which are aimed at the accomplishment of the immediate tasks of production, including the rendering of services to it. The USSR Ministry of Geology as before is evaluating the work of sectorial institutes according to their economic effectiveness as a whole. But under the conditions of cost accounting a calculation of the economic impact is impossible with respect to many direct contracts, and, besides, clients do not require it. A contradiction arises: one should either abolish this indicator or find a rational ratio of the different types of work, which makes it possible to formally maintain the economic effectiveness at a high level. Of course, preference is being given to the former.

The increase of the amounts of work on the development of scientific and technical products significantly strengthened the economic status of the institute. The

cost accounting revenue for 1988 came to 1.8 million rubles, more than 60,000 rubles were transferred to the fund of the production and social development of the collective, nearly the same amount is in the reserve. The average annual wage as compared with 1987 increased by 25 percent and came to 3,680 rubles per staff member. Labor productivity grew by 43 percent. The output-capital ratio increased by 131 percent.

The establishment of funds of production and social development made it possible to settle many questions. A laboratory and office building of the institute is under construction. The construction of a multi-unit apartment house has been started. Several apartments were built on a sharing basis with the production expedition. Whereas previously the obtaining in a year of 1-2 apartments was considered a large yield, in 1988, 12 of them were occupied. The availability of internal earned assets made it possible to channel significant sums into the purchase of vacations, the allocation of loans to young specialists and material aid, the implementation of health improvement measures for staff members of the institute, and the rewarding of the winners of the socialist competition. Whether previously one had to be content with only moral stimuli, now the departments can receive up to 1,500 rubles for winning the competition.

The changeover of the institute to the system of taxation is next, but a number of difficulties are arising here. Thus far there is no detailed substantiation of the economic forms of the implementation of both the second model of cost accounting as a whole and the very system of taxation. Procedural elaborations on this question are lacking. We have to seek a way out of the situation by ourselves. A special commission for the drafting of temporary statutes on work under the conditions of cost accounting has been set up. Its basic task is to develop at the transitional stage a framework of scientific research activity, which is more or less acceptable for the institute.

The institute worked the past year in accordance with the statutes that were drafted for the Turkmengeologiya Production Association as a whole. Experience showed that whereas their basic features are applicable to the conditions of science, the details require substantial modification. Thus, in 1988 remuneration was carried out monthly with the quarterly payment of the incentive portion of the wage fund, which is formed as a result of the cost accounting activity of the departments. However, we have been convinced that such an approach is ineffective in science. The material reward should be paid for the end results of development, not for its performance. At present such a model of the remuneration of labor, which would stimulate high quality and efficiency, is being developed at the institute.

The first year of work on a cost accounting basis also revealed such a weak point as the monitoring of the systematic fulfillment of scientific research developments, which are financed by means of centralized

sources and of which the Turkmengeologiya Production Association and the USSR Ministry of Geology are the clients. There were irregularities, one of the jobs was delivered late. Such negative features are a heavy burden on the entire collective of the institute, decreasing its prestige in the sector. Special commissions for the quarterly acceptance of the materials of jobs, which are being performed in accordance with state orders, have now been established at the institute and in the apparatus of the Turkmengeologiya Production Association.

Report on Georgian Academy of Sciences General Meeting

18140285 Tbilisi ZARYA VOSTOKA in Russian
29 Jun 89 p 3

[Article (GRUZINFORM): "The Republic Academy of Sciences: Through the Prism of Changes"; first paragraph is ZARYA VOSTOKA introduction]

[Text] The annual general assembly for hearing reports of the Georgian SSR Academy of Sciences was held in Tbilisi. The participants stood and observed a moment of silence to honor the memory of the innocent victims of the events of 9 April and the residents of the mountainous region in Adzharia, who died tragically, as a result of the natural disaster.

President of the Georgian Academy of Sciences Albert Tavkhelidze, winner of the Lenin Prize and the USSR State Prize, opened the assembly.

During the past year the people of Georgia happened to experience many disasters. Avalanches, landslides, floods and mud flows, and strong winds caused much destruction in many regions of the republic, it was noted at the assembly. The tragic events, which occurred in fraternal Armenia as a result of the catastrophic Spitak earthquake, were perceived as a personal misfortune. And in this case literally on the same day, when the first underground shock occurred, an expedition of specialists to the region of the catastrophe was organized by the Georgian Academy of Sciences. The recommendations of scientists were also taken into account here by the government commission when making prompt decisions on the elimination of the consequences of this terrible natural phenomenon.

Another recently established commission for the elaboration of proposals on interethnic relations, which it is planned to discuss at the forthcoming CPSU Central Committee Plenum, began to work under the Academy of Sciences.

The evaluation of all the most important and crucial engineering projects began to be carried out with the participation of specialists of academic institutes and the public of the republic. One of the projects discussed is the project of the laying of the Transcaucasian Railway Line. The authoritative opinion of specialists played a considerable role for halting the implementation of this idea.

Restructuring has touched upon all the activity of the academy. It has changed over to the new methods of the planning and financing of research. Physical assets have begun to be allocated for specific programs of basic development and scientific and technical development. Creative collectives, which are interested in the rapid completion of planned research, have been set up and have begun to work at institutes. The results of the performed work have become the best testimony of scientific collectives—their maturity and ability to fulfill efficiently the assigned research and the orders of production workers. The labor of scientists, especially young specialists, is being remunerated in a more differentiated manner. Such collectives obtained by their labor great opportunities for the acquisition and "leasing" of the most diverse equipment and computer systems. The academy was able to acquire during the past year more than 100 personal computers precisely with the deductions from the completion of such urgent jobs. Much, however, still has to be done in order to raise the prestige of scientific work to the proper level.

The national economy of Georgia is preparing for the changeover to cost accounting and self-financing. Under these conditions the unbalance of the normal operation of many sectors of its industry and agriculture has begun to tell especially perceptibly. Here much has to be done by economics scholars, demographers, and sociologists so that the changes being planned would not destabilize, but, on the contrary, would strengthen even more the economy of the republic. Social scientists, historians, and linguists have to perform serious work in order to interpret the events, which are occurring in the socioeconomic life of Georgia, and to rally its people for the successful solution of the difficult problems facing them.

Vice Presidents of the Georgian SSR Academy of Sciences and Academicians of the republic Academy of Sciences Andrey Apakidze and Givi Sanadze, Academician Secretary Academician Leo Gabuniya, and Academician Secretary of the Applied Mechanics, Machine Building, and Control Processes Department Mikhail Khvingiya submitted for discussion accountability reports on the basic scientific achievements during the past year and the tasks for next year and addressed the assembly.

The election of new members of the academy was held in November of last year. Now there are 65 academicians and 94 corresponding members in it.

Large changes occurred in the management unit of the academy. Younger, distinguished scientists, who had made a significant contribution to the development of Georgian Soviet science, also became members of the presidium. A number of academician secretaries of departments of the academy were replaced. The directors of 20 institutes were democratically elected. This process is continuing. The election and the reorganization of the management units took place at the same time as the specification of the new priority directions and the refinement of the traditional priority directions of the

further development of Georgian science. Fundamental questions were discussed collectively: in what directions Georgian science is to develop in the immediate and more distant future, to which collective it is possible to entrust the fulfillment of the outlined tasks.

The union academy has outlined for fulfillment in the long-term future 18 basic research programs. Georgian scientists are taking part in the practical implementation of 17 of them. It is a matter of the most prestigious studies. Among them are the elaboration of the scientific principles of the development of solid-state devices for electronics and optoelectronics of a new generation, the physical chemical bases of biology and biotechnology, and new materials and substances for the development of new generations of equipment and other promising jobs.

Along with this 20 institutes of the academy prepared and submitted more than 100 proposals for participation in 14 other all-union scientific and technical programs. Such is a far from complete list of jobs, with which scientists of Georgia are now busy. But there are problems, the solution of which is of great importance first of all for our republic.

The Georgian Academy of Sciences has planned the implementation of about 20 republic basic research programs.

With the active participation of scientists of academic institutes state programs of the study, development, and improvement of the Georgian language and scientific studies and the popularization of the history of Georgia were compiled and the principles of the changeover of the national economy of the republic to full cost accounting and self-financing were formulated. A large amount of research is planned on the study and the seeking of efficient means of the use in the national economy of natural resources—minerals, mineral waters, and recreational resources.

The fact that academic science began to cooperate more closely with VUZ and sectorial science, was also a distinctive feature of the outlined plans. The group of questions, which are being settled by joint efforts, was significantly expanded. During the past year 80 developments of researchers were introduced in the national economy. An economic impact of 15.5 million rubles was obtained.

Specific steps are being taken to strengthen ties among the academies of sciences of the republics of Transcaucasia. For this purpose a coordinating meeting of representatives of the academies of the republics of Transcaucasia was held for the seeking new opportunities to conduct joint research. In particular, in the area of hydraulic engineering and power engineering, the protection of the environment against pollutants.

Democracy and glasnost are now characteristic of all the work of the academy. This also found expression in the statements of the scientists who participated in the discussion that developed on the reports. Many critical remarks,

which concerned the organization of and payment for research work, and rational suggestions on the improvement of the methods of its planning, organization, and financing were expressed.

Particular attention was devoted to the discussion of questions of ecology and the socioeconomic situation and of the interethnic relations that had formed in the republic in recent times.

Bureaucracy Punishes 'Rebellious' Engineers

18140306 Moscow *TEKHNICA I NAUKA* in Russian
No 5, May 89 pp 16-20

[Article: "Not Everyone Can Endure This..." Passages in boldface as published]

[Text] The bureaucrats have worked out an effective mechanism of reprisal against recalcitrants. Some kind of conflict occurs, an avalanche of undeserved reprimands is brought down on the "guilty party," and he is left without a job after the very first certification. Here is what the victims are saying:

A.V. Gusev, candidate of agricultural sciences, former general director of the "Vesna" Association, former director of the "Marfino" Sovkhoz, former deputy chief of Glavmospodovoshchprom:

I had developed a unique technology for cultivating vegetables and flowers in agricultural greenhouses. If it were launched into production, it would be possible to calmly feed fresh vegetables to Muscovites, as well as to residents of other cities, by mid-season in 1990.

Everything was going normally. However, one day I refused to sign an act of acceptance for a combine built with many faults and unsubstantiated overexpenditures of 35 million rubles. Yet, the press had already announced the release of the combine for use. Principle-mindedness turned into a misfortune that I have been unable to get out of for many years already: they dismissed me due to "unsuitability."

Yu.L. Rodimov, chemical engineer, former senior scientific associate at GIAP, author of 20 inventions:

I had worked at the institute for 20 years. Eighteen of them were good, but the later years immediately became bad. People who had been friendly to me only yesterday suddenly became enemies, malicious, and cohesive. They slandered me at meetings without a twinge of conscience and their lies were put in the minutes. They did it specially, in order to hide someone behind the collective's back. After my dismissal, the higher authorities refused me, citing these minutes.

V.I. Nikitin, candidate of technical sciences, former chief technologist at the USSR Minvodka Nechernozemselkhozvodosnadscheniye Trust and, after his dismissal and reinstatement, senior engineer at the same trust:

Our labor legislation has given the administration the right to pardon or punish engineers.

I observed white-washing and figure-padding for many years. I became so fed up, that I could not stand it and spoke out at a meeting to expose it. For this, they punished me...

I was late to work the day I came back from a business trip. I had coordinated this with the department chief. However, they dismissed me for the 3 hours tardiness. He denied his own words in court.

Yu.I. Yemelyanov, candidate of chemical sciences, former senior scientific associate at Moscow State University Chemistry Department, author of 175 scientific publications:

The press is devoting a great deal of attention to my high frequency ozonizer. SOVETSKAYA ROSSIYA, PRAVDA, TRUD and IZVESTIYA have written about its troubled fate. However, the effect of the articles was negative: I was left without a job. The bureaucrats left me "for the collectives:" the collective will investigate it, after all, it is now the time of democratization. But the collective was scared. It is no accident that when, on orders from above, they began to destroy my ozonizer, I saw that many sighed with relief. What kind of defense can it be a question of, when people have no civic position?

"I have worked in science for more than a quarter century," says Kamil Ibragimovich Mangushev, doctor of technical sciences, USSR State Prize winner:

The struggle against the scientific intelligentsia, started by the "revolutionary masses" and their "leaders" back in 1917-1918, continues even now. In the "glorious years" of Khrushchev and Brezhnev, a rebirth of many of the surviving "Mohicans" of science occurred, and they were especially overgrown with young scientists. Science is the first to sense impending changes in society's life. Many are making conclusions for themselves: if you want to live—adapt!

And they have adapted! Clan monopoly in science has developed into the now already-formed big and little scientific mafias. Protectionism has filled the institutes with indifference toward work and with aggressive ignorance toward eccentrics who work successfully.

Talent became enemy No 1 for the scientific "leaders" and their cronies, who grow duller with every year.

Am I exaggerating? Not a bit! For the time being, science is not leading restructuring, but is being dragged along behind it. Once again, work is drowning in the pompous phraseology of leaders of the USSR Academy of Sciences, the country's other academies, the USSR State Committee on Science and Technology, and of the directors of scientific research institutes and VUZs [higher educational institutions]—the "restructurers" for all times and on all "lines"...

In this regard, where will the expected successes in scientific and technical progress come from? From cooperative workers? ...From the joint scientific production enterprises with foreign capital, which are essentially destroying the country?

Let us consider only a few important, in my opinion, aspects of the functioning of the country's scientific organizations.

The first thing which must be done in order to improve our science is to really, not in words, but in actions,

democratize the entire scientific organism of the country, all aspects of its life and activity.

I am forced to repeat myself several times over. What should be done?...

The scientific council, freely elected by the scientists themselves, should become the boss, the effective and real leading democratic body of any scientific research institute or VUZ.

Precisely the institute's scientific council should determine the scientific research strategy and the procedures for and amounts of financing for research. It should approve the programs and methodology of the most important studies.

It is especially necessary, it seems, to point out again and again the need to solve all cadre problems and, in particular, to conduct the certification of scientists only at open meetings of the institute's scientific council, honestly and objectively, ensuring mandatory glasnost, giving each an opportunity to defend his scientific positions and the results of his work.

The point is that the mass certification of scientific employees in 1986-1987 has aggravated this problem beyond belief. It turns out that they started the certification, emasculating the democratic meaning behind it, by expelling the most productively working, but "temperamental" scientists.

Scientists ended up entirely under the control of institute directors, who converted certification into a powerful method for suppressing scientific dissidence and criticism aimed at them. Each director rapidly outfitted the certification committees with their own loyal people and now usually get rid of "unruly" scientists, having whispered with these "committees" in the silence of offices. However, after all, it is possible to defame anyone, having subverted an open, public certification, originally intended as a democratic act, by the secret agreement of a group of people. This has happened already... A similar "method" of rating people and scientific directions with all kinds of "threes" and "sevens" left too terrible a track on our history, to let it revive anywhere now.

It is necessary, vitally necessary, to destroy the often exaggerated "authority" of institute directors by separating administrative and scientific power. There should be two directors in an institute—both a commercial (manager) and a scientific leader. This idea entirely conforms to the reform of the political system being carried out in the country, in which party leaders are freed of economic leadership.

In this respect, the scientific leader (or scientific director) should be elected only by the scientific council, and should be elected by secret vote under truly competitive conditions (out of 2-3 candidates).

Of course, who better than the scientists themselves knows the people in this specific sector of science, who better knows their job?

Knowledge are scientific truth extracted through labor are the highest morals, and consequently, the crystal-clear integrity, devotion to science and unconditional feeling of personal responsibility for one's work; true intelligence and a respectful attitude toward others' opinions—only this makes a person a scientist. Look around yourself, do you see many such scientists? Although by nature I have always been and will remain an incorrigible optimist, I still answer this question: "No, not many, and fewer with every year." After all, I have been working in science for more than a quarter century...

Of course, in the first place, this is the result of the change in the evaluation criteria for scientists' labor. Over the last 2-3 decades scientists were deprived of the right of authorship to their own works (look at how many "common graves" are published in the name of numerous "authors"!), and were deprived of the opportunity to personally, openly and publicly discuss and defend their views and publish the results of their own research. How can he remain a creative personality under such circumstances?!

"The cause of the unfavorable situation in scientific collectives," believes V. Starodubtsev, a candidate of agricultural sciences from Alma-Ata, "is the tyranny of the directors, the shameless appropriation of their subordinates' scientific results by them and those close to them."

"The main problem," N. Kornilov, doctor of geological and mineral sciences, Minsk, continues this thought, "is that this pressure 'from above' leads to the irreversible deformation of young scientists' morale and does irreparable harm to the quality of scientific research."

Many comrades are writing with indignation about cases of scientists being forced by their "chiefs" and their hosts to bribery, artlessly disguised as co-authorship. About scientific research institute directors who have "written" thousands of scientific articles and thousands of monographs during their scientific lives and have received up to 500 "author's certificates" for inventions. About those close to directors—the department chiefs, proudly gazing from the stands of "honored inventions" and other no less pretty "honor boards"... Yet, meanwhile the collectives of these institutes know full well that these people have invented one thing in their lives—a method for sticking on to other people's inventions and scientific developments and illegally raking money, stolen from their subordinates, into their own pockets.

The second no less important problem for improving our science is the elimination of the present-day social dejection and legal defenselessness of Soviet scientists, simply of scientists without nomenclature chairs.

What are administrators of all stripes and calibers doing to them right now?! Yet, we only exclaim "ah!," having found out about scandalous cases of violations against scientists from the newspapers and magazines. We let off

steam, lie down on the sofa, and that is that. But the scientist... may God help him! However, we keep saying that precisely the scientists should save our sickened economy.

Resisting the idiocy of local governments, which in the waste of the "struggle against alcoholism" used bulldozers to annihilate the best vineyards in the Crimea, a doctor of sciences who had devoted his whole life to creating elite varieties of domestic grapes, exhausted his spiritual and physical strength and hung himself. What did we do? Did we hold the guilty parties responsible? Did we start to think about whom we had lost and in the name of what?...

And what led to the fatal streak of Academician V.A. Legasov, who killed himself in a hospital in the spring of 1988? If it was an intensified feeling of personal guilt for the Chernobyl tragedy, why do other apostles of nuclear energy sleep peacefully? Not only do they sleep, but also fiercely stifle any criticism of the unsubstantiated and thoughtless program for the accelerated construction of structurally ill-considered nuclear power stations (AES) in our country. If, as they write, V.A. Legasov had received a "large dose of radiation" at Chernobyl and could not bear to wait for the inevitable, terrible end, then everything seems simply like a criminal venture. What kind of "accelerated construction of AES" can it be a question of, if there are no individual devices for protection from radiation in the country, even for an academician?!

In any case, the loss of V.A. Legasov is the result of the suppression of the opinion of scientists and specialists by "great people," the result of the suppression of glasnost in science and of scientific dissidence.

Really, could Chernobyl have happened (and who is to say that this is the last accident at an AES?), would they have really let ignorant people destroy Kara-Bogaz-Gol and the Aral Sea, would they really have permitted the land reclamationists and chemists to poison and destroy the native land, would they really have allowed stealing from the state treasury for constructing the BAM, which turned out to be unneeded by anyone and maimed by its hasty origination, if these multi-billion ruble projects had been discussed by scientists and specialists, if their opinion in this matter had been respectfully studied?!

No, however, people capable of having their own opinions about things are entirely unacceptable to bureaucrats in science (indeed, for all bureaucrats!). Look more closely, and see how many doctors and candidates of science in recent years lead a wretched life, having lost their jobs on the "leadership's" whim. Now scientists full of strengths loiter about various reception rooms in the hope of being heard, are forced to work in various cooperatives, and are digging in garden plots. What are we doing? These are the brains of the nation!

One associate, always characterized only in the best light, had worked at the USSR Academy of Sciences Siberian Department Institute of the Earth's Crust for 15 years.

He went from laboratory worker to senior scientific associate, and defended his dissertation. Suddenly, he becomes unsuited to his position... "as a consequence of his egotistical nature and inability to work in a scientific collective," as written in the certification reference.

The candidate of sciences was asked to choose one of the vacant jobs, to which, in the leadership's opinion, he was suited: an auxiliary worker, an extra-departmental security guard, or a janitor. He agreed to become a guard, but they nonetheless dismissed him.

How was the egotistical mentality of this person displayed? In that he finally gathered up the courage and refused to include people in the co-authorship of his monograph who had nothing whatsoever to do with writing it.

There are many such examples, and not only in the USSR Academy of Sciences system. Alas, the "systems" are the same everywhere.

How long will this go on? The entire history of world science is a chain of the illuminations precisely of dissidents and the unruly. The new is always born when somebody looks at things and does not think like everyone else, but thinks differently, his own way.

Why are we so afraid of the creators of the new, of thinking people? Why are our scientists so furiously crushed? Whom do we plan to use to ensure the sharp scientific and technical burst, needed to boost the country's economy? Is this possible with frightened people and humble mediocrity?

In our country, scientists who have become the victims of administrative arbitrariness are entirely defenseless.

In the procedure existing in the country, if some petty tyrant drives a doctor or candidate of sciences out of work, having deprived him of the scientific work already done and of a means of existence, he cannot turn to a people's court, but should seek defense only in his own department where, of course, his chances of finding justice are next to nothing: the director's "authority" and, mainly, his connections always end up being stronger than any proof or fact.

Unfortunately, the newly passed Law on the Procedure for Court Appeals on the Illegal Actions of Officials who Have Infringed on Citizens' Rights, has not changed the position of scientists, since they have once again been included in the infamous "List No 2," and have again been assigned a "different procedure for appeal." In our opinion, this is a repetition of past mistakes which requires immediate correction.

It is necessary to finally pass a law to protect scientists—the nation's tremendous "grey matter," created by incredibly difficult efforts and easily bogged down, the country's "gold reserve." It is necessary to protect scientists' honor and dignity, to guard them and their creations from arbitrariness and the already too persistent "supervision" by those who clean out others' heads, and

from envious ignorance. We must protect them with the force and authority of law, not with hopes for the personal qualities of the periodically changeable leaders of scientific organizations.

Great personalities are very rare, and then they have a habit of leaving life significantly earlier than scoundrels.

During my 25 years of work in three scientific research institutes, I endured, I "withstood" six directors. Of them, only two were real scientists and real scientific leaders. I still think that I was lucky. Many scientists are far less fortunate.

The public organizations of scientific institutions are usually clearly "oriented." Somehow, I have never happened to hear that a scientist, suppressed by the administration, found understanding and assistance in the party and trade union committees of the institutes. On the contrary, the party committees and trade union committees start finishing off the director's "enemy," excelling in zeal in this regard and violating all laws of the party and the country. And just to please "their own" boss! We also, it seems, have no public covering detachment against the massacre of scientists. A person remains alone in a circle of people, whom only yesterday he considered his friends, colleagues, pupils... Not everyone can endure this.

The "theory" and practice of base and anti-constitutional defamation has flourished here unusually. Naturally, a person torn away from his job begins to look for other work in his field. Everywhere, he runs into a wall of alienation: it turns out that people from his former institute called this organization and "warned" them...

The creative union of the scientific and technical intelligentsia is the USSR NIO [Scientific-Engineering Society] Union, which is called on to raise the social status of workers in science. About 45,000 doctors and 475,000 candidates of sciences work in our country. This represents enormous strength! It should be organized, the feeling of professionalism and the personal dignity of scientists should be raised.

The USSR NIO Union should raise its voice to defend colleagues, should stand up for their rights, and should help them in difficult times, both with advice (finding a job, discussing and publishing scientific works), as well as with rubles.

I would like to mention something else. For a long time I have been in favor of converting science to cost-accounting. Even 15-20 years ago, I personally experienced and practiced the principle of the operation of scientific organizations according to economic contracts with enterprises. Right now, I am also closely tracking the conversion of scientific organizations to self-financing and full cost-accounting. I do not know what others think, but I am alarmed by the thick layer of scum in scientific life, caused by these processes.

Right now the euphoria of unprecedented earnings reigns here. Indeed, for many years scientists remained practically the lowest-paid category of working people in the country. (According to the average wage, in 1985 science was substantially inferior to industry, construction, transport, and a number of sectors of the APK [Agro-Industrial Complex]). This was an obvious underestimation of science's role in society. They have consciously and for a long time averted scientists from work.

Now the situation has changed sharply. And, as often happens here, it has swung to the other side. In 1988 and the current year, in many research and especially in design institutes, people were astounded by the many thousands in pay increases, additional payments and bonuses that descended on them... for, in general, routine work.

I am not at all against high salaries for scientists. God forbid! Scientists should be paid more. It is possible to create something new under contemporary conditions, when you are not concerned with the problem of how to live on your salary.

However, scientists should be paid for work with their heads, and not for a fuss of elbows and legs! The danger of the intolerable earthing of science during conversion to cost-accounting has always existed. However, in my opinion, no one expected that which we are seeing today, in 1989, to occur.

Let us consider the thematic plans for scientific research institutes in past years and compare them to the themes, amounts and geography of contracts for 1989.

There is an avalanche-like increase in all sorts of petty, albeit sometimes necessary, but essentially petty subjects.

A designer slaps together a fairly good nut. Then he sits on an airplane, flies all around the Union and concludes contracts with aviation, automobile, and machine tool building enterprises and other sectors of industry in Kiev and Tolyatti, Sverdlovsk and Leningrad, Kutais and Minsk, and so on.

Work done in a single day is sold repeatedly. The designer is delighted, his leadership fairly... Everything is good, but...

Research institutes, primarily sectorial, are energetically turning themselves into cooperatives for scientific services. "To develop a reagent...", "to develop a standard...", "to study the influence of the wind from Petrovka on the milk yield in Ivanova..." This is not a joke by the author, but reality. Science has undertaken the solution of stale local technical problems, to compiling brilliant reports, capable under contemporary conditions of somehow singling out local chiefs from among hundreds of their colleagues.

An unhealthy polarization of forces is also occurring in the scientific research institutes. Well, as everyone

knows, a doctor of sciences will not go to the ends of the earth to ask for money to develop multi-colored soap bubbles.

But the dodger—there he is! He flies in, brings a sack of contracts for doing any kind of work (a non-professional, he is after all "free," for him any work is unknown, which means that it does not matter what he does). Now, he is already master of the institute! He can "take" a doctor of sciences onto his team, or he can not.

However, alas, the time comes to do the work, and then they get the poor pushed-around doctor of sciences out of the corner and, just as before, say: "You must save the institute." Yet, what if he suddenly turns out to be rancorous and proud, and refuses? What will the smooth dodgers and the institute directors do?

The situation must be corrected. For implementing a development already fulfilled by the institute, a contract for the scientific research institute should be signed by the commercial director, with the feedback of the scientists, not just anyone. For all new themes ("developing...," "studying..."), the contract should be signed by the institute's scientific director, on the recommendation of the theme's scientific leader after the institute's scientific council or a section of it has discussed the question.

Then, scientific democracy, glasnost, and the institute's economic interests, as well as respect toward scientific workers, will be observed.

The scientific world is very complex and delicate. Our history quite convincingly attests: all the attacks by sailors, cavalymen, and especially by party bureaucrats, have led our country to nothing, if not to the total lag of our country in all sectors of science and economic spheres. Has all this really not taught us anything?!

Now Engineers and Scientists Have Defenders

The board of the USSR Union of the Creative Intelligentsia passed a resolution to create the Committee on Social Aspects of Scientific and Engineering Work. Its basic task is to consolidate the forces of engineers, scientists, and inventors.

The committee includes USSR Union of Writers member V.D. Dudintsev, Academician N.N. Moiseyev, publicist V.I. Selyunin, USSR Deputy Minister of Justice M.P. Vyshinskiy, and many other public leaders and specialists.

One of the main directions of the activity of the new public organization is to work with the complaints of engineers and scientists, and to protect their honor and dignity at places of work and in judicial and supervisory agencies. In debatable cases, the committee intends to provide lawyers and send appeals to the ministries and the CPSU Central Committee.

The committee will publish the annual "Struggle Against Bureaucracy in the Administration of Science and of Scientific and Technical Progress."

The Committee on Social Aspects of Scientific and Engineering Work will receive visitors on Tuesdays from 11:00 until 13:00 at the address:

119034, Moscow, Kursovoy Per., 17, second floor, White Hall.

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Institute's Treatment of Superconductivity Scientist Criticized

18140311 Moscow PRAVDA in Russian 1 Aug 89 p 3

[Article by PRAVDA special correspondent A. Tarasov under the rubric "Science: The Fate of a Scientist": "The Superconductivity of Nonsense"; first paragraph is PRAVDA introduction]

[Text] It is not even a matter, it seems, of avoiding absurd plans. They are, perhaps, inevitable, like the elements of nature—rain, snow, a hurricane. But of building strong walls and roofs against them. That is, of escaping absurd versions. This is our main scourge, which is capable of turning any common sense inside out.

If I were to say that they are now engaged in this at the Moscow Institute of Radio Engineering, Electronics, and Automation, there probably everyone, from the student to the rector, would posture. Slander. And a most insignificant case besides. Against the background of universally brilliant general scientific successes.

Yes, I am taking one case. But it is possible to judge from a drop the state of the sea. The case is as follows: the imminent, it is an extraordinary one, recertification of former senior, but now junior scientific associate Aleksey Stefanovich.

For what?

The question is not accidental. For the statute on certification states in no uncertain terms: "If he has not given a favorable account of himself."

Is this the case?

Speaking objectively, for scientific foresight. In a large number of scientific works starting back in 1979 the young theoretical physicist in collaboration with his supervisor, Professor M. Savchenko, predicted nothing other than high-temperature superconductivity.

Yes, the very same one, which caused a shock in the scientific and technical world after the experimental discovery of the two Swiss scientists J. Bednorz and K. Muller, who were awarded the Nobel Prize for this. The intelligent Swiss became famous in 1987, having experimentally increased the temperature of superconductivity to the level of liquid helium. Our countrymen a year earlier in the monograph "Fluktuatsionnaya sverkhprovodimost magnitnykh sistem" [The Fluctuation

Superconductivity of Magnetic Systems] generalized an entire years-old series of similar theoretical research.

After the shock a laboratory boom broke out: designs—relatives of perpetual motion—began to loom. Another technical revolution acquired visible traits. The most prominent scientists of the present began to talk about it at symposiums, seminars, and conferences, in the press, and on the air.

Among others a report on the works of Savchenko and Stefanovich was also heard at the meeting of the expanded Presidium of the USSR Academy of Sciences in April 1987, which was devoted to high-temperature superconductivity. Their peculiarity is that high-temperature superconductivity in ceramics, which were baked on the basis of rare earth metals, was theoretically predicted and substantiated. Precisely such a lanthanum-barium-copper-oxygen compound later on brought fame and the Nobel to Bednorz and Muller. What an interesting coincidence! But is it perhaps not a coincidence? Is it perhaps a hypothesis that proved to be correct? Is it perhaps a convincing theory? Is it perhaps simply a discovery?

The authors actually drew up an application for the discovery, which is now being examined in the State Committee for Science and Technology. I would not say that it was greeted with an ovation. This is natural—criticism and doubts are always a mandatory technical control division in the scientific world. Perhaps the entire possible range of opinions has been gathered in the expert folder. From “the novelty of the theory does not arouse doubts...the priority of the authors in this area is confirmed...” and “the theory can lay claim to a discovery” to “the formula of the discovery does not conform to reality” and “this is nothing more than nonsense.” I will note the increased irritability of some reviewers and the quite well-balanced logic of the authors, who counter the reproofs in their responses. And on no account am I undertaking to judge the fact of a discovery—this is the competence of highly educated specialists and a special organ of the State Committee for Science and Technology. I want merely to share the suspicion that if the same tentative mention of rare earth metals in connection with high-temperature superconductivity had appeared among more venerable and well-known scientists, perhaps the picture would be different, and the matter would have proceeded now if not to a Nobel, then to a State Prize.

Thus, we will hold that it is a matter not of a discovery. In the end this is just a formality. It is a matter of the essence. And the essence is that in the regular certification of 16 January 1987, at the very height of his rather success work with a shining reference of the chair, in which substantial publications in the Soviet and foreign press, sufficient public activity, and a contribution to teaching methods are cited, Candidate of Physical Mathematical Sciences A. Stefanovich was deemed...unsuitable for the position of senior scientific associate and

was dismissed from the institute. He was initially dismissed, then as a final favor was reinstated as a junior scientific associate in another chair.

Two years later, having published since the time of certification another nine serious works on high-temperature superconductivity, including in DOK-LADY AKADEMII NAUK SSSR and the British journal SOLID STATE COMMUNICATION, papers and works of all-union and international conferences A. Stefanovich is already, apparently, also unworthy of the position of junior scientific associate.

From the standpoint of the simplest common sense this is also nonsense. Why turn out of the house a young, energetic, productive worker, who is also capable, perhaps, of bringing the institute considerable fame?

With this question I ask for a meeting with Academician N. Yevtikhiyev, rector of the Moscow Institute of Radio Engineering, Electronics, and Automation. But Nikolay Nikolayevich does not want to meet. And he does not want to talk at all about the works of Savchenko and Stefanovich. Yes, that is literally the case. They have nothing to do with our institute. They have their own personal plan, the institute has its own.

This here is, pardon me, a trick. The head of one of the leading chairs, a professor, and a member of the European Physical Society is also “on his own, past the institute.” I manage only to find out that the institute “took their route,” but did not achieve anything and is now taking the “American” route. Some sort of childish notes are heard in the voice of the academician. They seem to have promised a pail, but gave a sieve. I can only guess that, perhaps, he expected from the theorists an exact chemical formula of the sensational ceramic, but they indicated “only” the class of materials, on which experimenters still had to spend time.

I am unable to entreat, I had to have a more thorough talk with the more amiable dean of the faculty, A. Sigov, who in addition is the secretary of the party bureau of the institute, dean of the faculty, head of the physics chair, from which they are now banishing Stefanovich, and chairman of the certification commission that threw him out the first time.

But Aleksandr Sergeyevich as if feebly throws up his hands in face of the recurrent nonsense. It turns out that while the talented young physicist worked successfully for 10 years at his own chair of solid-state physics, where he prepared his candidate and doctoral dissertations, to which he wrote an application to be hired, to which he came by competition as a senior scientific association, and where with his supervisor he achieved all but brilliant results, his economic contractual vacancy “strolled” among other chairs. While peace reigned, they turned a blind eye to this. As soon as the relations of the rector with the group of Professor Savchenko, with which he also used to collaborate, became strained, a sacrifice was required. And here it is. A certain conclusion of the certification commission concerning the fact

that Stefanovich was not fulfilling (of course) his economic contractual functions where he was registered, appeared. This is as if an opposing, negative reference, with which, incidentally, they did not acquaint the culprit either on the eve or an entire 2 years after it "went to work."

And, incidentally, they "pulled" the unwelcome physicist from the comfortable perch at the moment, when the vacancy and spot had been successfully combined, and he was successfully fulfilling the required economic contractual theme at his already legitimate chair. There and then they cut him, the dear fellow, off, having transferred him to a place where he again proved to be out of place.

I have to plunge into the details (and there are far more of them than it is possible to present) not only in order to understand the mechanism of the nonsense. The commission appointed by the USSR State Committee for Public Education following the appeal of Stefanovich also "digested" them together with me. Professor L. Ter-Martirosyan came specially from Leningrad to head it. It was no trouble to convince the commission of the high scientific skill and the effectiveness of the work of Stefanovich. But, on the other hand, it also did not dispute the certification decision. All this was reflected in the document. It would seem, it is possible to get from such a contradiction a split personality, but the commission preserved enviable integrity. As did the State Committee for Public Education, from which V. Lishkin, deputy chief of the Main Administration of Scientific Research Work, sent the institute the recommendation to consider the question of the more efficient use of Stefanovich "as a scientist who is dealing with urgent questions of high-temperature superconductivity."

In my joy I call Prorector for Science D. Rasskazov. They say, by the way, you received such a splendid recommendation.

"Well, so what?" he replied absent-mindedly.

And indeed: So what? Are they to use the physicist as a physicist, as was recommended in the letter, when there are economic contractual vacancies? And as what in their absence? A bartender at the Mytishcha station?

And, in general, it is necessary to cite several dialogs.

"You see, I am sitting and smiling," Dmitriy Stepanovich said so that I would see more easily over the telephone. "Today I am sitting a last day here in this position and am going through my papers. Tomorrow the new prorector will come, you and he decide."

The new prorector, F. Motuzko, said on the day of his accession:

"I only receive documents. But I have already listened to two comrades from his chair and have signed a decision on early certification...."

"On what basis, Fedor Yakimovich?"

"Well, so far they do not have written substantiations. They say that he refuses to work until he becomes a senior scientific associate...."

"But have you listened to Stefanovich himself? Is he perhaps not working poorly?"

"No, I have not talked with him. I still do not clearly understand these questions...."

Wonderful. He did not understand and did not listen, but he did make a decision. A truly restructuring pace and style.

Another prorector, N. Kurtev, speaks of the work of Stefanovich on high-temperature superconductivity reluctantly and arrogantly:

"At his chair he did not work, he hung around the chair of solid-state physics, there are, you know, many of these theories, there is little use...."

But now either he "hung around" or "the high scientific skill of comrade Stefanovich and his knowledge in the field of solid-state physics are confirmed by a large number of scientific publications," as was stated even in the most negative document.

All this, of course, differs sharply from the firm opinion of the authoritative physicist who organized this discipline at the institute, Professor Savchenko. Maksim Aleksandrovich considers his young coauthor a capable and independent scientist who has a great sense of his own worth, which at times also prevents him from getting accustomed to his surroundings.

V. Tkachev, deputy dean for the scientific research section, during our conversations indirectly confirmed this, having heard the opinion that under such conditions Einstein would also not be a senior scientific associate here.

"Of course, with respect to the economic contract he would not!" said Viktor Ivanovich without batting an eye. "But with respect to the state budget he would!"

It is a wonderful feeling to deal with the fate of Einstein!

And he began to try to persuade me that his colleagues from the chair are indignant with the junior scientific associate, deducting from their own cost account wage for his wage. That they are demanding that he be removed because he is doing his own work "there," and not work, which is uncharacteristic for him, "here."

But it is also necessary to know how to do this: to put a person in such a position in order to play him off against the indignant people around him and to endanger his closest comrades. The great art of administration and its magic also consist in this.

In addition to purely practical qualities, it is also necessary to have here some moral qualities. Professor Sigov is one of three doctors of sciences, who defended their dissertations under the supervision of Professor

Savchenko, the scientific supervisor whom, as it turns out, they have in common with Stefanovich.

And here earlier, while working as an associate at the neighboring chair of solid-state physics, Aleksandr Sergeyevich during discussions spoke very positively about colleague Stefanovich, his abilities and efficiency. Now, having become a dean and having gotten his own chair, he has made a sharp turn.

"I have changed my attitude toward Stefanovich," he says, replacing the smile with a hardness of the face. "And I believe that he cannot work here, since he is doing his own work, while rejecting chair assignments."

The fate of the "defendant," as you see, has been decided in advance. Is it worth moaning about the legality of both the fixed-date and the early certification, pointing out the minor and major jugglings, the nonsense, and even the obvious deception in their materials, if the statute on certification itself allows the administrator to do with everyone whatever he wants, however he wants, and whenever he wants? It is a truly general-purpose tool. How much has been said and written about this—and the law and the academy are silent.

Let us return from the particular to the general. Is Stefanovich doing "his own" work. No, he is doing work, for which a state program was drawn up. Millions of rubles have been released, tens of academic and VUZ laboratories have been involved. The Moscow Institute of Radio Engineering, Electronics, and Automation, which, incidentally, is the head institute in the system of the RSFSR Ministry of Higher and Secondary Specialized Education for high-temperature superconductivity, allotted it only 50 special-purpose wage rates. Does a theoretical physicist, who is working productively in

basic research that is suggesting methods of synthesizing new high-temperature superconductors, have the right to hold a place in this program? There is one answer: he does not have the right, but he should.

Yet no one is worried about the means of giving him this place. But furious energy and thousands of reasons are being found to remove the scientist from his place. What is one to call this? The superconductivity of nonsense—I cannot find another thing.

And a kind of postscript. It turns out that the sensational ceramic, which brought the two Swiss fame, was obtained for the first time back before them in our country, at the Institute of General and Inorganic Chemistry of the USSR Academy of Sciences. But for other purposes—at that time our chemists did not check it for superconductivity. But if they had.... This concerns precisely the relationship of theory with practice.

A second postscript. PISMA V ZHURNAL EKSPERIMENTALNOY I TEORETICHESKOY FIZIKI has just reported the experimental detection in polymer materials of indications of high-temperature superconductivity at room temperatures—in the range of 300 degrees Kelvin. The article of scientists of the Institute of Synthetic Polymer Materials of the USSR Academy of Sciences headed by Academician N. Yenikolopov is about this. But in 1984 M. Savchenko and A. Stefanovich theoretically examined and substantiated this phenomenon in the article "The Fluctuation Theory of the Superconductivity of Polymer Systems." Perhaps, this second coincidence (or theoretical discovery) will move the certification commission to make the steps against Stefanovich more strict. Now they will not allow him even into the laboratories. The superconductivity of nonsense is also, as is known, infinite, when there is no resistance to it.

Engineers Congress Plans Formation of Independent Union

18140299a Moscow NTR: PROBLEMY I RESHENIYA in Russian No 11 (98), 1989 p 2

[Article by O. Kolesnikova under the rubric "Panorama": "An Association of Independent Engineers"; first two paragraphs are NTR: PROBLEMY I RESHENIYA introduction]

[Text] A significant event occurred the other day in Moscow—the constituent congress of the USSR Federation of Engineers was held. Much has been said in recent years about the necessity of establishing an independent creative union of engineers.

USSR Deputy Minister of General Machine Building V. Ye. Sokolov, a radio engineer, was elected president of the central board of the Federation of Engineers. Candidate of Technical Sciences D. M. Levchuk, a mechanical engineer, became secretary of its board. The founder of the Federation is the USSR Union of Scientific and Engineering Societies.

"The federation will unite the most talented and active engineers of our country, who have to their credit major developments and the solution of difficult production problems," says Doctor of Technical Sciences A. P. Vladislavlev, a petroleum engineer and chairman of the USSR Union of Scientific and Engineering Societies. "Moreover, the engineers who belong to it will no longer be on the staff of other organizations. The federation, the main task of which is the increase of the activity of the engineering corps of the country and the most efficient use of the potential of the best personnel in the priority directions of scientific and technical progress, will become their basic place of work. The federation will increase the level of education and competence of its members, defend the creative, social, and legal interests of engineers of the country, conduct an independent examination of the most important engineering projects and solutions, and give assistance to industry. Thus, for example, the members of the federation—according to preliminary estimates their number will not exceed 3,000-5,000—will work at industrial enterprises on contracts. Assistance in the establishment of a new plant, the solution of the problems of an unprofitable enterprise, the construction and equipment of new facilities in our country or abroad, and much more can be the content of the contract. Here an enterprise, which inquires about a highly skilled engineer, fixes a higher salary for him and, moreover, pays the federation itself for the specialist.

"If for 2 months 'there is no demand' for an engineer—that is, he is not offered contracts—he receives the average wage from the federation.

"The establishment of the federation of engineers is the first step in the direction of the organization of the

Engineering Academy. The assignment of the engineering corps of the country to the ranks of engineers, federation members, and academy members is proposed in the future."

At the constituent congress much was said about the specific factors that are hindering engineering creativity.

"One continually has occasion to hear about problems of introduction," said Doctor of Technical Sciences L. M. Volchkevich, a mechanical engineer and professor of the Moscow Higher Technical School. "The administrative command system believes that if we are not forced to deal with robots, rotors, flexible machine systems, and so on, there will be no progress at all. But this is not true! No administrative nooses are needed. Because the whole point is not the introduction of new equipment, but its quality.

"A problem arises when excessive expensive, unproductive, inconvenient equipment, which does not match the given works, is forced upon enterprises. They said that people will tear a good commodity from your hands, but you will not foist a bad one off by force. But I would say: a commodity, which they force upon someone, will never be good. Because most often they will not make it conscientiously, if people also buy a poor one.

"Now engineering development is usually conducted 'in a laboratory under the supervision of academician so and so.' Is independent creativity possible within such departmental subdivisions? Forgive me, but I do not believe this. I do not believe that these conditions will also be created in cooperations—after all, they were initially programmed for other purposes. One thing remains: to believe in our new engineering federation. That it will actually be the engineer's conscience and will protect our rights. And, what is the main thing, it will launch its own creative production activity."

Exposition Shows Weaknesses of Metal-Cutting Technology

18140299b Moscow NTR: PROBLEMY I RESHENIYA in Russian No 11 (98), 1989 p 2

[Article by B. Ivanov under the rubric "Panorama": "The End of a Monopoly"; first paragraph is NTR: PROBLEMY I RESHENIYA introduction]

[Text] The second international exhibition "Equipment, Instruments, and Tools for the Metal Working Industry" was held in Moscow from 31 May to 8 June. The exhibits of firms and organizations of 21 countries were located on the grounds of two exhibition complexes—the Sokolniki and Krasnaya Presnya complexes—with a total display area of 28,000 square meters.

Several months before the opening of the exhibition in a conversation with our correspondent, Doctor of Economic Sciences V. Faltsman expressed fears that the present excessive investment in flexible automation with its concentration in metal cutting, in particular, could

have a ruinous effect on the development of other promising metal machining technologies. Do experienced workers share his anxiety?

The expositions, be it a Soviet, American, or Romanian one, do not leave any doubts that today metal cutting is the individual leader, while numerous flexible manufacturing systems, flexible modules, and NC machine tools are obediently working for it. But does such a technical spurt actually not threaten the mothballing of technology?

I asked specialists from the Moscow Scientific Research Institute of Machine Building Technology, within the walls of which they are dealing with the development of various methods of machining metal, to answer the questions that interest me.

"The anxiety of the economist is not without grounds," replied V. Yermolov, supervisor of the exhibition group of specialists of the institute. "Metal cutting traditionally has a strong scientific and personnel potential and a powerful technical base, which enables specialists in this technology to react quickly to the demands of industry and to relegate to the background other types of machining, at times without also considering expedience.

"Such a monopoly checked, for example, for about 10-15 years the development of entirely competitive electrochemical technology. That is why its displays at the exhibition are also quite modest. However, it must be noted that a favorable situation for electrochemists is already beginning to form today. An enormous need, especially with the begun plastic 'boom,' for the production of dies and molds has appeared in industry. But in the production of these items neither NC machine tools nor any other metal-cutting equipment can for the present replace the labor-intensive manual work of the tool maker.

"But, for example, at our institute specialists have already developed two electrical discharge machines, which make it possible to produce forging dies without manual finishing. True, for the present not high-precision ones. Here the problem lies in the lack of the necessary control system. In order to develop it, the institute is conducting talks with specialists from the GDR. Development will require 1.5-2 years.

"And as soon as reliable high-precision control systems appear in the electrical discharge machines, an earnest offensive against the monopoly of metal cutting will begin."

RSFSR Awards State Prizes for Science, Technology

18140286 Moscow SOBRANIYE POSTANOVLENIY
PRAVITELSTVA RSFSR in Russian
No 12, 1989 pp 249-253

[Decree No 120 of the RSFSR Council of Ministers "On the Awarding of the 1989 RSFSR State Prizes in Science and Technology" of 12 April 1989]

[Text] On the Awarding of the 1989 RSFSR State Prizes in Science and Technology

Having considered the suggestions of the Committee for RSFSR State Prizes in Science and Technology attached to the RSFSR Council of Ministers, the RSFSR Council of Ministers resolves:

To award the 1989 RSFSR State Prizes in Science and Technology to:

1. Doctor of Physical Mathematical Sciences Lev Nikolayevich Mazalov, deputy director of the Institute of Inorganic Chemistry of the Siberian Department of the USSR Academy of Sciences; Doctor of Chemical Sciences Vadim Ivanovich Nefedov, head of a laboratory of the Institute of General and Inorganic Chemistry imeni N.S. Kurnakov of the USSR Academy of Sciences; Doctor of Physical Mathematical Sciences Ernst Zagidovich Kurmayev, head of a laboratory of the Institute of Metal Physics of the Ural Department of the USSR Academy of Sciences; Academician of the Ukrainian SSR Academy of Sciences Vladimir Vladimirovich Nemoshkalenko, deputy director of the Institute of Metal Physics of the Ukrainian SSR Academy of Sciences; Doctor of Physical Mathematical Sciences Tatyana Mikhaylovna Zimkina (posthumously); Doctor of Physical Mathematical Sciences Vadim Alekseyevich Fomichev, director of the Scientific Research Institute of Physics attached to Leningrad State University of the RSFSR Ministry of Higher and Secondary Specialized Education; Candidate of Physical Mathematical Sciences Anatoliy Tarasovich Shuvayev, head of a department of the Scientific Research Institute of Physics attached to Rostov State University imeni M.A. Suslov of the RSFSR Ministry of Higher and Secondary Specialized Education; Doctor of Physical Mathematical Sciences Igor Aleksandrovich Brytov, deputy general director of the Leningrad Burevestnik Scientific Production Association of the USSR Ministry of Instrument Making, Automation Equipment, and Control Systems—for the development of the theory, methods, and instruments for X-ray spectral studies of the chemical bond.

2. Yuriy Timofeyevich Ivchenko, deputy chief of the Main Production Administration for Gas Production in Tyumen Oblast of the USSR Ministry of the Gas Industry, supervisor of the work; Candidate of Technical Sciences Vasily Sergeevich Antipov, deputy chief of a division of the same administration; Doctor of Technical Sciences Tamara Vasilyevna Kuznetsova, head of a chair

of the Moscow Chemical Technology Institute imeni D.I. Mendeleev of the USSR State Committee for Public Education; Candidate of Technical Sciences Anatoliy Aleksandrovich Klyusov, head of a laboratory of the Tyumen Scientific Research and Design Institute of Natural Gases of the Tyumengaztekhnologiya Scientific Production Association of the USSR Ministry of the Gas Industry; Candidate of Economic Sciences Mikhail Makarovich Shalyapin, deputy director of the same institute; Azat Akhmetovich Akhmetov, deputy general director of the Tyumenburgaz Production Association of the USSR Ministry of the Gas Industry; Vladimir Andreyevich Verchenko, chief of an administration, and Mamotsali Khamurziyevich Pliyev, drilling foreman, workers of the same association—for the development and introduction of plugging materials, which ensure the reliability and the quality of construction of petroleum and gas wells under the conditions of the Far North.

3. Doctor of Technical Sciences Valentina Georgiyevna Derkasova, head of a chair of Tomsk Polytechnical Institute imeni S.M. Kirov of the RSFSR Ministry of Higher and Secondary Specialized Education, supervisor of the work; Gennadiy Petrovich Germash, deputy chief of the Experimental Design Bureau; Candidate of Technical Sciences Vladimir Kuzmich Dyupin, senior engineer, Alla Andreyevna Yedozhenko, design engineer, German Nikolayevich Knyazev, engineer, Yevgeniy Mikhaylovich Kupriyanov, chief of a division, workers of the same design bureau; Doctor of Technical Sciences Olga Isakovna Martynova, head of a chair of the Moscow Power Engineering Institute of the USSR State Committee for Public Education; Candidate of Technical Sciences Lyudmila Mikhaylovna Zhivilova, head of a laboratory of the All-Union Heat Engineering Scientific Research Institute imeni F.E. Dzerzhinskiy of the USSR Ministry of Power and Electrification—for the development and introduction of methods and instruments for the automatic checking of the quality of the process waters of power engineering and water treatment plants.

4. Valeriy Mikhaylovich Artemov, lead engineer of the Institute of Applied Geophysics imeni Academician Ye.K. Fedorov of the USSR State Committee for Hydrometeorology; Vladimir Ivanovich Burik, tester of a scientific research institute; Doctor of Technical Sciences Vladimir Pavlovich Zharov, acting head of a chair of the Moscow Higher Technical School imeni N.E. Bauman of the USSR State Committee for Public Education; Candidate of Physical Mathematical Sciences Vladimir Vladimirovich Zuyev, head of a laboratory of the Institute of Atmospheric Optics of the Siberian Department of the USSR Academy of Sciences; Doctor of Physical Mathematical Sciences Yuriy Nikolayevich Ponomarev, deputy director of the same institute; Doctor of Technical Sciences Valentin Ivanovich Kozintsev, chief of a department of a scientific research institute; Candidate of Technical Sciences Aleksandr Fedorovich Silnitskiy, chief of a laboratory of the same institute; Mikhail Borisovich Bogachev, lead engineer of

a special design and technological bureau—for the development of methods and equipment of the laser absorption analysis of the gaseous components of the surface atmosphere.

5. Corresponding Member of the USSR Academy of Medical Sciences Pavel Vasilyevich Sergeyev, head of a chair of the 2d Moscow State Medical Institute imeni N.I. Pirogov of the RSFSR Ministry of Health, supervisor of the work; Candidate of Medical Sciences Nikolay Lvovich Shimanovskiy, head of a laboratory of the same institute—for the monograph "Retseptory fiziologicheskii aktivnykh veshchestv" [Receptors of Physiologically Active Substances], which was published in 1987.

6. Vladimir Mikhaylovich Yevteyev, chief of a department of the All-Union State Planning Institute for the Surveying and Design of Surface Water Supply Lines, Sewer Systems, and Hydraulic Structures; Tamara Fedorovna Stepanova, design engineer, Nikolay Georgiyevich Filippov, senior design engineer, workers of the same institute; Emma Ilinichna Kashenkova (posthumously); Sergey Nikolayevich Kislitsyn, chief of the Vladivostok Production Administration for the Operation of the Artemovka Hydraulic Development of the Primorvodokanal Production Association of the Maritime Territorial Production Association of Housing and Municipal Services of the RSFSR Ministry of Housing and Municipal Services; Rimma Mikhaylovna Petrova, deputy chief of the Primorvodokanal Production Association of the same territorial production association; Doctor of Technical Sciences Nikolay Pavlovich Rozanov, head of a chair of the Moscow Hydromelioration Institute; Mikhail Vasilyevich Kolontayev, installer of a specialized administration of the Podzemstroy Trust of the Primorkraystroy Territorial Construction Association of the Ministry of Construction in the Eastern Regions of the USSR—for the comprehensive solution of social and ecological problems during the construction and assimilation of hydraulic structures (on the basis of the example of the hydraulic development on the Artemovka River for the water supply of Vladivostok and Artem).

7. Doctor of Biological Sciences Iosif Ivanovich Grachev, supervisor of the work (posthumously); Doctor of Biological Sciences Nikolay Petrovich Alekseyev, head of a laboratory of the Scientific Research Institute of Physiology imeni A.A. Ukhtomskiy attached to Leningrad State University of the RSFSR Ministry of Higher and Secondary Specialized Education; Doctor of Biological Sciences Vadim Petrovich Galantsev, director, Candidate of Biological Sciences Stanislav Mikhaylovich

Popov, senior scientific associate, Candidate of Biological Sciences Valeriy Grigoryevich Skopichev, senior scientific associate, workers of the same institute; Doctor of Biological Sciences Elvina Pavlovna Kokorina, head of a laboratory of the All-Union Scientific Research Institute of the Breeding and Genetics of Agricultural Animals of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin; Doctor of Biological Sciences Aleksey Grigoryevich Taranenko (posthumously)—for a series of works of the physiology of lactation in eight books, which were published during 1973-1987.

8. Academician of the USSR Academy of Medical Sciences Yuriy Mikhaylovich Lopukhin, director of the Scientific Research Institute of Physical Chemical Medicine of the RSFSR Ministry of Health, supervisor of the work; Doctor of Biological Sciences Ofeliya Akhatovna Azizova, head of a laboratory, Corresponding Member of the USSR Academy of Medical Sciences Aleksandr Ivanovich Archakov, head of a department, Doctor of Medical Sciences Emmanuil Markovich Kogan, head of a laboratory, Candidate of Medical Sciences Sergey Sergeyevich Markin, head of a laboratory, Candidate of Medical Sciences Yelena Semenovna Nalivayko, senior scientific associate, Doctor of Medical Sciences Valeriy Ivanovich Sergiyenko, deputy director, workers of the same institute; Candidate of Chemical Sciences Irina Pavlovna Andrianova (posthumously)—for the development and introduction in clinical practice of new methods of the diagnosis and treatment of atherosclerosis.

9. Alfred Avgustovich Visnap, former chief geologist of an expedition of the West Siberian Geological Production Association of the USSR Ministry of Geology; Valentin Vladimirovich Gorodnichev, geophysicist, Semen Stepanovich Gubkin, drilling foreman, Mikhail Ilich Zotov, senior geologist, Aleksandr Aleksandrovich Muratov, former chief of a division, Elmar Martynovich Pakh, former senior geologist, Kirill Aleksandrovich Sitnikov, drilling foreman, Nikolay Ivanovich Shcherbakov, former senior geologist, workers of the same association—for the discovery and prospecting of deposits of coking and power-generating coals in the Kuznetsk Basin for advanced strip mining.

[Signed] Chairman of the RSFSR Council of Ministers
A. Vlasov

Administrator of Affairs of the RSFSR Council of Ministers I. Zarubin

Moscow, 12 April 1989. No 120.